THE POLAR TIMES

RESEARCH LABORATORY TODAY—A recent photo shows laboratory at Point Barrow and ice pack and Arctic Ocean beyond. In center is H-shaped headquarters and laboratory building, first permanent NARL building, built in 1968 at cost of $2 million. Runway and new $1,7 hangar are out of sight at upper right. In foreground is lake. *(UA photo)*

The Polar Times

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No. 75 *DECEMBER 1972*

Land Selection Problems Confront Alaskan Natives

The New York Times

ANCHORAGE, Dec. 18—A year after passage of the Alaska Native Land Claims Settlement Act, which settled a 104-year-old dispute about who owns Alaska and gave the aboriginal citizens $962.5-million and 40 million acres, the natives are concerned that the act may not be implemented properly.

When President Nixon signed the act Dec. 18, 1971, the tribes relinquished all claims to the other 325 million acres of Alaska and accepted Western cultural concepts of dealing in land and money.

But they are poorly equipped to cope with the problem of selecting 40 million acres, an area the size of Maine, New Hampshire, Vermont, Massachusetts and Connecticut, from the largely unknown Alaska wilderness, which is so vast that it will take the Bureau of Land Management 30 years just to survey it.

And the natives fear that rigid deadlines, unclear definitions and seemingly conflicting provisions in the act, slow-moving Government bureaucracies and changing national political directions may thwart the good intentions of Congress.

Under the act, agencies such as the B.L.M., the United States Park Service and the Fish and Wildlife Service are to assist the natives in gathering technical data about the land. But the agencies lack enough staff members to coordinate the raw information they have at hand.

With President Nixon's continuing reorganization of the Government and his intention to cut Federal spending, many officials here are cautious about assisting the natives too rapidly. The act, for instance, requires the establishment here of a central library about land, but that library now consists of little more than a few journals and unindexed boxes and cabinets of data.

The recent shake-up at the Department of Interior, and particularly the removal of much authority from the Assistant Secretary of the Interior, Harrison Loesch, whom the Alaskan natives regard as sympathetic to them, also may cramp the settlement since new people, unfamiliar with the complex terms of the act, may become responsible for its administration.

The natives also fear that reduced Government spending and Indians from the contiguous 48 states, who are said to be envious of the largest aboriginal claim settlement ever made, will induce Congress to curtail spending for the Alaskan natives.

They also do not want Congress to expect that settlement funds, which are to be channeled into profit-making corporations, will take up the slack in social services. Merely maintaining social services such as health care and Bureau of Indian Affairs schools, which the natives feel they deserve regardless of the settlement, would in less than 20 years cost more than the entire $962.5-million payment for relinquishing the claims.

Congress recognized that the enormous land and money accruals to the Alaskan natives would generate clashes between the white and the Eskimo, Indian and Aleut cultures. Congress also foresaw long-drawn-out arguments and shifting alliances among Alaska's three major landowners: the natives, the state and the Federal Government.

To combat this potential divisiveness, Congress outlined, in the 29-page law, complicated formulas that would clarify ownership in Alaska. A joint Federal-state land-use planning commission was established, government agencies were to begin compiling available information on land resources and titles, and other agencies, such as the Bureau of Indian Affairs, were instructed to review all Federal programs dealing with the natives.

To minimize the possibility that inexperienced or unscrupulous native leaders or fast-talking whites might fritter away the ettlement for thousands of people. Congress prohibited sales of land by natives for 20 years. It also moved to spread the cash proceeds over at least 11 years and throughout more than 200 village and regional corporations.

Each of the 75,000 or so quarter-blood or more natives is to receive 100 shares of stock in one of the 12 ethnically oriented, profit-making corporations that represents his or her village. For natives who live outside Alaska but can claim a share from ancestral rights, the act authorized a possible 13th corporation to distribute the cash, but not the land.

At the heart of the social, economic and political directions that the native groups will take for decades to come is the land selection process. They must decide whether they want traditional hunting and fishing lands, potential recreation lands or areas with oil, gas or mineral potential when they cull their 40 million acres from about 100 million that have been put aside. Yet the village corporation have only two more years, and the regional corporations, three years, to determine their land choices.

The tribes, which have among them the poorest, least educated and unhealthiest people in the United States, lack a managerial class and a sophisticated communications-transportation network to ease implementation of the settlement. They are attempting to set up the decision-making processes that are provided by the act, but face many problems.

For instance, the 12 regional corporations, which will control subsurface (oil, gas and mineral) rights to all 40 million acres, must wait until the vil-

ALASKA AWARDED SUBMERGED LAND

U.S. Judge Gives State Title to Area Claimed by U.S.

ANCHORAGE, Dec. 15 (AP)—In what has been called a "historic" first involving "untold millions" in oil resources, Alaska has been given title to submerged lands in Cook Inlet in a dispute with the Federal Government.

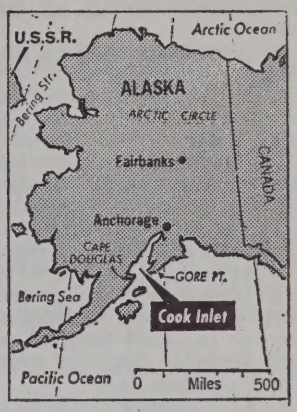
Federal District Court Judge James A. von der Heydt, in a case that began in May, 1967, ruled yesterday that all of Cook Inlet north of the Cape Douglas-Point Gore line, including the Barren Islands, are inland waters of the state of Alaska and not an arm of the ocean.

Judge von der Heydt also said the "subsurface resources of lower Cook Inlet are vested exclusively in the state of Alaska."

The suit began in the spring of 1967 when the state attempted to lease potential underwater oil and gas sites in the 4,000 square mile area.

In testimony early this year, geologists said the lower inlet contained $2-billion in petroleum resources based on known geologic structures and the six-year offshore production record of Upper Cook Inlet.

Cook Inlet is about 200 miles long and 40 miles wide at its widest point.



The New York Times/Dec. 16, 1972

The state would receive an estimated $235-million in oil production revenues from the area.

The Federal Government contended that lower Cook Inlet waters and lands beneath could not be considered inland waters of the state.

But Judge von der Heydt ruled "the requirements for the emergence of historic title have been satisfied under the general principles of international law."

The court ruled that the state had exercised its authority over lower Cook Inlet without "interruption from 1906, and very possibly earlier, until the time this dispute arose."

Gov. William A. Egan, in Fairbanks, called it a "great, great day for Alaska."

lage corporations select 22 million acres of surface rights. Much of that acreage, however, may be encumbered by valid mining claims or potential state or Federal public easements, or may be under lake and stream beds that could be defined as navigable waters, with subsurface rights reverting to the state.

To complicate matters, the villages, few of which are formally organized, cannot select land until they have been incorporatd.

In many remote areas, the villagers are hardly familiar with the outlines of the settlement. Even if they do know it, many must learn new concepts of ownership, of land divided by ideas such as townships and acres, rather than by familiar rivers or mountain ranges. The word township does not even exist in Eskimo.

With an average of $500,000 per region for initial organization, many corporations, which must rent offices, hire staff members, consultants and lawyers and pay expenses for village meetings, believe they do not have enough money to start properly. For instance, the Arctic Slope Regional Corporation, which has no roads connecting any two of its seven villages, estimates that a two-day meeting of village leaders and consultants costs $10,000 just for communications, room and board and charter aircraft.

The regional groups, which all have been incorporated temporarily by small bands of leaders, cannot by law make long-range decisions until the Bureau of Indian Affairs certifies their stockholders and a permanent regional corporation board is elected.

The bureau, however, will not complete the native enrollment until March, 1973. Since the land and money will be distributed partly on a regional and village population basis, native leaders now can only make educated guesses about what their regional and village options will be.

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AUGUST HOWARD, Editor

THE POLAR TIMES highly recommends "The Polar Record," published by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are one dollar a year, which entitles members to receive THE POLAR TIMES twice a year.

Back issues are 50 cents each.

AIDJEX project ends on Arctic Ocean ice

AIDJEX '72, the nation's largest research effort on Arctic Ocean ice, is over.

Evacuation of the AIDJEX ice station some 300 miles north of Barrow got under way April 29 and, with pilots flying around the clock, was completed in little more than a day.

"It's all wrapped up—they ran 24 hours straight through," John Schindler, director of the Naval Arctic Research Laboratory at Barrow, reported

The laboratory, operated for the Navy by the University of Alaska, and its aircraft fleet provided most of the direct support for AIDJEX (Arctic Ice Dynamics Joint Experiment).

The big research effort was financed mainly by the National Science Foundation and Office of Naval Research.

At the height of this year's experiment, some 60 scientists were working from a camp on sea ice comprised of about 30 buildings. Computers and laser beams were among the sophisticated devices and instruments employed in the intensive research effort aimed at determining how the atmosphere and ocean influence the movement of the ice pack.

Data from this year's AIDJEX effort is expected to help solve many important theoretical and practical problems, among the latter the problem of navigating in the ice pack by tankers and other vessels.

Coordinator and chief scientist for the 1972 effort was Dr. Norbert Untersteiner of the University of Washington. Scientists from Japan and Canada and universities and institutes around the United States took part in the research.

In the last days of the ice station, which will begin breaking up later this month, three Soviet scientists flew in from one of their own Arctic Ocean ice stations to observe operations. They also spent three days at Pt. Barrow, visiting the Eskimo village and inspecting facilities of the naval laboratory, Schindler reported.

Interior Ariways C130 Hercules aircraft, under contract to the laboratory, and the laboratory's own smaller aircraft transported more than 70,0000 pounds of material to the ice station since its establishment last Feb. 25.

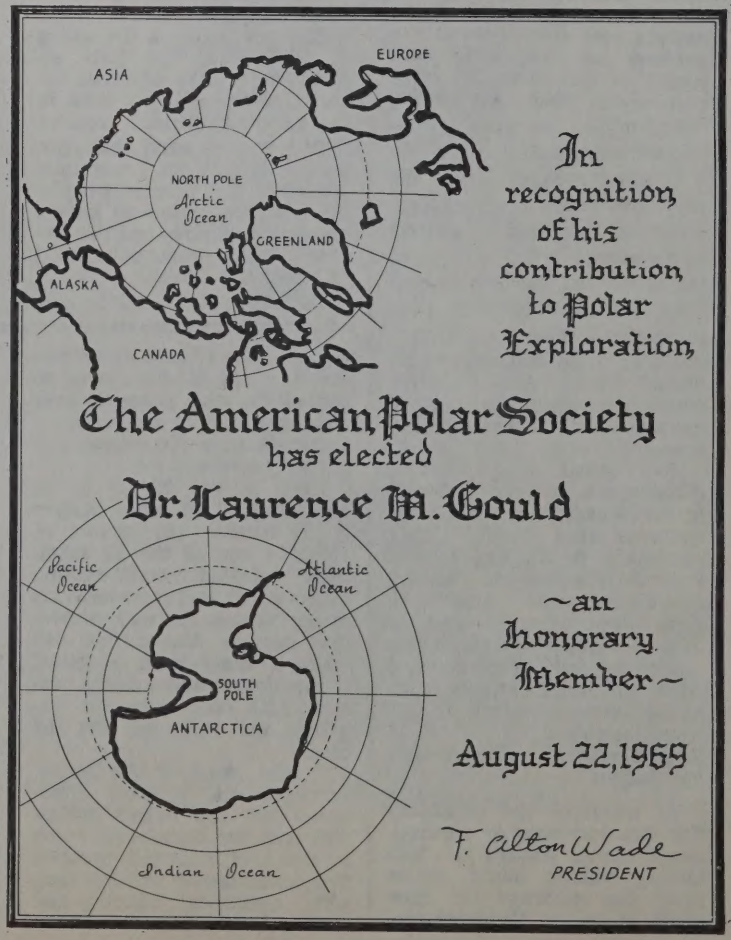
Most of the prefabricated buildings comprising the station were left on the ice. The doors and windows were salvaged. Schindler said it would cost more to fly out these shells than they are worth.

Two intact buildings were left behind on the ice, as emergency shelter for persons who might be forced down in that general area, Schindler said.

Five men will remain on the ice for the next week or two to complete a seismic propagation study. They will be working near the abandoned AIDJEX station and from a tent camp some 80 miles away.

Schindler says they will be brought off the ice before breakup by a laboratory R4D (DC-3) if ice conditions permit, or by lighter aireraft if the ice cannot accommodate the R4D.

AIDJEX '72, despite its unprecedented scale, is still classified as a pilot study. It's the third such study. AIDJEX will come to an end in 1974-75 with large-scale year-long research on the ocean ice.



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NARL's anniversary

By GERALD E. BOWKETT
Manager, University of Alaska News Service Aug. 14

Twenty-five years ago the Naval Arctic Research Laboratory was established on the Arctic Ocean shore near Point Barrow, and today a special program marking this anniversary is being held on the University of Alaska's Fairbanks campus in conjunction with the 23rd Alaska science conference.

The only United States laboratory devoted to fulltime support of basic research in the arctic, it is today an extensive complex whose most obvious feature is an impressive $2 million headquarters and laboratory building completed in 1968 providing modern hotel-like comfort for visiting scientists in one of the world's most hostile environments.

Quonset huts of various sizes still dominate the NARL scene, but they are for the most part well-heated, snug buildings. Those used as residences have attractive interiors. One large quonset serves as the base theater, a double-quonset as messhall and lounge. Another building of this type houses a general store.

It wasn't like this in the beginning—when Dr. Laurence Irving, then of Swarthmore College, and six other biologists scrambled down from a C46 cargo plane onto a steel-mat runway there on Aug. 6, 1947.

Swarthmore held the first Office of Naval Research contract for scientific studies in the Arctic, and Irving, now advisory scientific director of the University of Alaska's Institute of Arctic Biology, had been designated to head this group and establish a research laboratory.

Without the big government oil exploration program in the petroleum reserve, which involved the construction of a major base camp at Point Barrow, NARL probably would not have been established, say the authors of "Arctic Laboratory." The existence of these camp facilities made other activities possible that otherwise would have been prohibitively expensive.

In the beginning, Irving and his six fellow biologists had the use of one, small, single-story quonset hut but the following year a larger, two-story hut was made available, and the staff of scientists and technicians was increased to 30.

In 1949 John Hopkins University took over operation of the laboratory. From 1953 to the present time, the University of Alaska has been the operator, under Navy contract.

The university appointed Max C. Brewer director of NARL in 1956. Brewer held that position until 1971 when he resigned to become the first head of the state's new Department of Environmental Conservation. During his tenure, the laboratory experienced its greatest growth and progress. Subsequent to completion of the $2 million laboratory and headquarters building in 1968, NARL, first permanent building, a $1.7 million hangar was constructed where the NARL aircraft fleet, backbone of its support operations, is sheltered and maintained.

On July 1, of last year, John F. Schindler, who had been assistant director of the far-northern laboratory since 1962, was named to succeed Brewer as its director.

This past spring, Schindler directed NARL support of the Arctic Ice Dynamics Joint Experiment (AIDJEX) on Arctic Ocean sea ice some 300 miles north of Point Barrow. It was the largest U.S. research effort to that time on the ice pack, involving nearly a hundred scientists at its peak, and data obtained from this effort could facilitate arctic navigation in the future.

NARL possibly is best known for its support of research on drifting ice islands in the Arctic Ocean. Since 1962 it has continuously supported a research base on Fletcher's Ice Island, also known as T-3, a massive chunk of glacial ice originally discovered and occupied by the U.S. Air Force.

But NARL's busiest season is summer, when scientists from many universities, governmental agencies, and institutes go into the Brooks Range and spread out over the North Slope from Cape Lisburne and Point Hope on the Chukchi Sea to the MacKenzie River, and beyond to the Canadian archipelago, to study such things as weather, marine resources, coastal morphology, soil, and animal and plant life.

From the beginning, the laboratory has recognized the keen intelligence and unique ability of Eskimos to survive in the north and has employed them in growing numbers to undertake maintenance and logistics activities and give advice when special problems of the Arctic arise.

The Navy laboratory exists primarily for support of the Department of the Navy and especially for those research projects funded by the Office of Naval Research. But its facilities are made freely available to all research projects funded by any government agency and consequently are heavily used.

JOHN SCHINDLER, seated, took over as director of NARL in July 1971, succeeding Max Brewer who resigned to become head of new State Department of Environmental Conservation. Schindler had been assistant director of the laboratory since 1962. With Schindler here is Dick LeFebvre, his assistant director for management. *(UA photo)*

Ice Tour Ends For CG Daughter

WOODS HOLE, Mass. — Miss Betty-Ann Morse, daughter of WO1 Charles V. Morse, USCG (Ret.), and Mrs. Morse, of Woods Hole, has returned from eight weeks with the Arctic Ice Dynamics Joint Experiment, 200 miles from Point Barrow, Alaska, in the Beaufort Sea.

She is a physical oceanographer, employed by the department of oceanography at the University of Washington, which administers the project, financed by the National Science Foundation and the Office of Naval Research.

A Whale Of a Price

Hyannis, Mass., Aug. 23 (AP)—What is believed to be a world record price for a whaling journal, $21,000, was paid today for a Nantucket whaler's account of an 1850 voyage to the New Zealand whaling grounds.

The illustrated account by William A. Folger of his voyage on the ship Monticello was bought at auction by an agent for a private collection in New Jersey.

Five Nations Meet In Canada to Plan Polar-Bear Study

BANFF, Alberta, Sept. 23 (Canadian Press) — Long-term research in the management of polar bears is the aim of representatives from five nations attending an international conservation convention this week.

Charles Jonkel of the Canadian Wildlife Service in Ottawa said yesterday that the group would submit suggestions to the triennial convention of the International Union for the Conservation of Nature and Natural Resources.

If approved, the union would likely forward the suggestions to the Governments of Canada, the Soviet Union, the United States, Norway and Denmark, all of which have polar bears in their jurisdictions.

"The suggestions just seek greements in terms of management and research among the five nations," said Mr. Jonkel. "We hope to get that part formalized and eventually we hope to add more things.

"Ultimately, we would hope other nations that have rights in the high seas, but don't necessarily have territorial areas that have polar bears, also will approve."

In an information paper Mr. Jonkel put out two years ago while attending the University of British Columbia, he said.

"Mere protection of the species from hunters is no solution to their preservation.

"The bears must be managed for three things simultaneously: to control nuisance bears in certain areas; to provide food, clothing and income for the Eskimos and Indians, and to save the bears from extinction. No solution to the problem will be simple."

The situation has not changed, he said

Mr. Jonkel, who researched black bears while at the Uni- said there was a subpopulation versity of British Columbia, of polar bears on the Labrador coast that was either disappearing or possibly had disappeared.

The 41-year-old native of Chicago personally does not consider polar bears as an endangered species.

"I would refer to certain subpopulations as endangered and other subpopulations as being in good shape and certainly capable of being hunted as a benefit to the species."

Research shows, he said that Canada has the largest number of polar bears, probably well over half of the world population, which is estimated at 20,000.

Brewer, Schindler laud progress of arctic lab

Aug. 15

Featured speakers at Monday's Naval Arctic Research Laboratory's 25th anniversary observance were NARL's former director, Dr. Max Brewer, and the new director, John F. Schindler.

Brewer left his post on being appointed as commissioner of the Alaska Department of Environmental Conservation.

Said Brewer, "I like to think that, as an institution, NARL has much to crow about on this, its silver anniversary. It started with the most humble of beginnings as is aptly shown by the picture of Dr. Laurence Irving's pioneering group posed in front of their extremely modest laboratory of 25 years ago. Twenty-five years later NARL, operating at all times on what were considered to be very modest budgets, has obtained international recognition for the work that has emanated from the efforts of its researchers.

"Additionally, and what is of far greater importance, the results of these efforts have, in numerous instances, provided the background data and reasoning affecting decisions at both state and national levels."

Brewer said, "The arctic environment was and still remains to a large degree an unknown environment for many people. Because it is unknown, it still retains a certain romantic interest for many.

"In addition, because of man's appetite for raw materials and the potential for finding these raw materials in the arctic areas, there exist national and international pressures for exploration and for developing methods of economic retrieval of the materials and of operating in this environment so new to many. Thus circumstances existed and continue to exist for a research laboratory to grow with continuing vitality, provided that it is properly organized so as to escape the doldrums of old age, often symbolized by almost continual reorganization, and contentment with past accomplishments."

Schindler outlined some of the accomplishments of the laboratory. "The feasibility study of the Air Force Distant Early Warning Line, Project Lincoln, was an early NARL investigation. We have used and reused that wonderful quote by a knowledgeable Canadian that 'the results of the research from a single permafrost program (at the laboratory) saved more money in construction of the DEW Line than the total NARL cost to that date."

Continuing, Schindler said, "The emphasis usually placed on applied benefits should not be allowed to eclipse the advances in our understanding of ecosystems within the rigorous parameters of the arctic climate. We have learned very basic things in arctic physiology and biology, about the fluctuations in animal populations, many facts of natural history concerning the polar bear, wolverine, whale and many others."

Canada Sends Icebreaker To Aid of U.S. Navy Ships

WASHINGTON, Oct. 8 (AP) —The Coast Guard said today that the Canadian Government had ordered one of its icebreakers to go to the assistance of two United States ships disabled in a heavy ice pack far above the Arctic Circle.

A Coast Guard spokesman said he had been informed that the icebreaker, the MacDonald, was about seven days from the two ships, which collided Friday some 720 miles north of Iceland. They are the Coast Guard cutter Edisto, and the Navy service ship Mizar

The spokesman said the Edisto was towing the Navy ship when the collision occurred. There are no reports of injuries, but the spokesman said that the Edisto reported that she could move only 100 yards an hour through the ice, which is about six feet thick.

CLEVELAND, Oct. 14 (AP) —The Coast Guard icebreaker Edisto has been freed from an ice pack 720 miles north of Iceland and may undergo repairs soon enough to return to the Great Lakes before winter sets in.

The Milwaukee-based cutter damaged a propeller Monday when she collided with another icebreaker, the Mizar. Both vessels became trapped in the ice, but the Edisto was able to work herself free.

The spokesman said that the Edisto would be towed to Iceland by the cutter Southwind

CARIBOU'S DEATH LAID TO LIGHTNING

Alaskans Shift Opinion on What Killed Animals

FAIRBANKS, Alaska, Aug. 12—Biologists of the Alaska Fish and Game Department, after consulting with atmospheric scientists, are now "99 per cent convinced" that lightning killed 53 caribou in June near Fort Greely, a former Army chemical, biological and nerve gas laboratory and test center.

The biologists had been skeptical about the mass deaths, about 120 miles southeast of Fairbanks, because none of the tightly packed group of animals appeared to have been starved, poisoned or killed by an avalanche.

The Alaska Fish and Game Commissioner, James Brooks, reported this week: however, that samples from a dozen caribou rumens, or first stomachs, showed no sign of toxic materials when analyzed by the Denver research center of the United States Bureau of Sport Fisheries and Wildlife.

Kenneth A. Neiland, a state biologist who specializes in animal diseases and caribou research, has also shifted his opinion that the cause of the deaths was "a mystery."

He visited the site, in a small alpine valley, three times before this week but altered his opinion after a trip with Dr. Glenn E. Shaw, an atmospheric science expert from the Geophysical Institute at the University of Alaska.

Dr. Shaw traced a nine-spoke trench etched by "a probably larger than average" lightning strike that extended beyond the 50-yard-wide area where the carcasses were found June 21 by an Army helicopter pilot.

The scientist said, "Most of the spokes went either toward a creek [about 200 yards away] or down toward a swamp region, which is consistent with lightning. It usually goes for the water table."

Four-legged, long-bodied animals such as caribou would conduct electricity better and receive a more severe jolt than would a human, he said.

Dr. Shaw and Mr. Neiland also said that lightning strikes of cattle had been reported in other states, but that the bolt in the Alaska range had killed "an unusually large number of animals."

Navy Trains Whales to Retrieve Torpedoes From Ocean

By LINDA CHARLTON
The New York Times

WASHINGTON, Sept. 5 — The Navy announced today a breakthrough of sorts in undersea technology with the disclosure that whales have been trained to retrieve objects such as torpedoes from depths of 1,500 feet or more in return for an occasional snack of fish.

The Navy did not disclose what plans, if any, there are for trained whales. A spokesman said later when asked about plans, that he did not know if there were any thoughts of perhaps developing a flotilla. The experimental project, code-named Project Deep Ops, was carried out at the Navy's research and development center laboratory in Hawaii.

But the project, which began n 1969 and was completed in 971, has "shown that a simple, highly responsive and economic-to-use system of recoveries to depths of at least 1,600 feet can be developed using trained whales," said a Pentagon spokesman who announced the project at a briefing.

When the tests in fenced ocean pens began, a 5,500-pound killer whale and a 1,200-pound pilot whale were used. But the killer whale was dropped from the project, the spokesman said, because the smaller species proved to be "the more reliable and controllable whale."

The tests involved training the comparatively docile aquatic mammal to find a dummy torpedo through the use of an attached acoustical beacon. Once the torpedo was found, the whale had to retrieve it through the use of a mouthpiece attached to a "hydrazine-gas generator lift device" or sling.

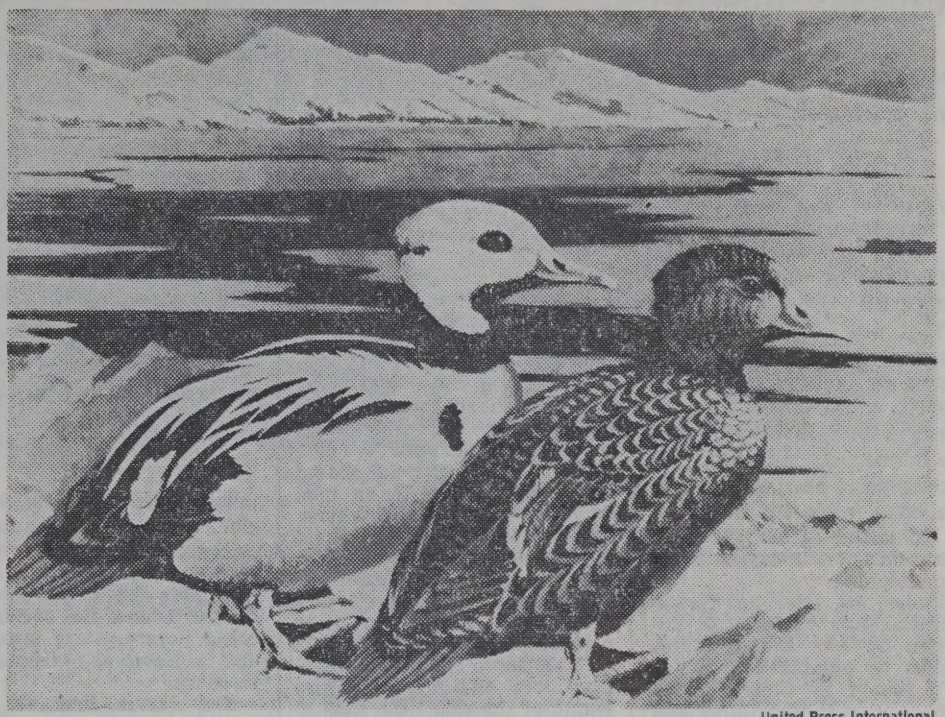
Deep Ops demonstrated, the Navy said, that the whale could lift an object with a submerged weight of 600 pounds from a depth of 1,000 feet, or of 300 pounds from a 2,000-foot depth. The maximum depth to which the "recovery hardware" was actually carried was 1,654 feet, the spokesman said.

A similar test project, code-named Quick Find and involving the use of sea lions as undersea retrievers, showed these far smaller ocean mammals to be useful only to depths of about 500 feet, the spokesman said.

"The project," the spokesman said, "also suggests the possibility of developing a recovery capability to 3,000 feet using other species of trained whales."

Neither of the two species used in Deep Ops is among those considered to be in danger of extinction. There are eight kinds of whales on the Department of the Interior's endangered-species list. Importation of whale products into the United States has been banned since December, 1971.

A five-minute film showing the training process — with small fish being tossed to them as reward—was released by the Navy. The film, made off the coast of Hawaii, showed the pilot whale recovering a dummy torpedo.



United Press International

HUNTERS' STAMP: The 1973-74 Federal stamp created by Lee LeBlanc of Iron River, Mich., depicts two Steller's eiders on a rocky Arctic shore. It will be the first time the variety will have appeared on the stamp for waterfowl hunters.

ALASKA MAY FACE LIFE-STYLE UPSET

Steeply Increased Needs Seen if Pipeline Is Built

WASHINGTON, Dec. 16 (AP) —"A potential major perturbation of the economy and lifestyle" of Alaska could result from construction of the trans-Alaska oil pipeline, says a study prepared for the consortium that is planning the pipeline.

The study, conducted for Alyeska by Mathematical Sciences Northwest, Inc., of Seattle, concluded that construction of the $3-billion pipeline would cause steeply increased needs for housing, schools, medical care, police and fire protection and other services.

Alaskan natives hired to work on the project may have a hard time readjusting to a more gregarious life, and locally hired construction workers in general may encounter stiff competition for new jobs once construction is completed, the report said.

Anchorage, Barrow, Fairbanks, Valdez and the Fairbanks-Valdez corridor would feel the impacts most strongly, it said.

Here are highlights of the study issued Tuesday by Alyeska:

¶Pipeline construction would speed up Alaskan growth, reaching economic and population levels two to three years sooner than otherwise.

"For example, at peak impact [1975], total employment is expected to be about 15 per cent higher [18,000 jobs] than it would have been without the project. Following this peak, growth in employment will be very slow until it resumes its normal long-term pattern in approximately 1978."

¶"Fifty per cent of the total peak differential increase in the trade and service sectors is expected to occur in Anchorage."

¶"The Valdez region will experience a doubling of employment levels, and impacts on medical, school and housing supplies will be significant."

¶"Peak [1975] population impact is projected at 40,000 on a statewide basis . . . Housing shortages will occur, and the use of mobile homes will be required."

¶"An increase in 'victimless crime,' e.g., prostitution, gambling, con games, etc., can be expected in the Valdez-Fairbanks corridor, resulting in a demand for additional police services.

¶"Double shifting of classrooms and teachers will be required in the Valdez area."

Also, after construction, "native Alaskan hires of Alyeska will presumably return to their villages trained in construction trades and converted to a cash-economy philosophy and may have problems adjusting."

Winnipeg Gets Eskimo Art

MANITOBA, Winnipeg (AP) A major share in what is believed to be the world's finst collection of Eskimo art has been purchased by the Manitoba government and will be placed in the Winnipeg Art Gallery. The carvings were acquired over several decades by a Winnipeg biologist-businessman, Jerry Twomey.

LAW AIDS NATIVES IN ALASKA HUNTING

Preference Given for Some Marine Mammal Species

The New York Times

ANCHORAGE, Dec. 23—As of last Thursday, the hunting of several northern species of animals is banned to all but Alaska natives.

The new Federal Marine Mammal Protection Act of 1972, signed by President Nixon on Oct. 21, to take effect 60 days later, makes the Secretary of the Interior responsible for protecting polar bear, walrus and sea otter, while the Secretary of Commerce is charged with protection of whales, sea lions, and dolphins.

Under the law, no marine mammal may be taken or imported by any United States citizen or organization, or by any person in United States waters or on United States land —with a special exemption for Alaska natives.

Native Alaskans may continue subsistence hunting, and may kill the animals for use in the traditional manufacture of handicrafts or clothing. That section of the bill met with opposition in Congress and has critics here as well.

"It's going to be incumbent on the natives to live within the intent of this special exemption," said Raymond H. Tremblay, special agent in charge of enforcing the act for the Interior Department in Alaska.

"They [natives] are living in a fishbowl, as far as the exemption goes. There was opposition to the exemption from preservationists, Congressmen and game management people. If the exemption is abused, the native may see an amendment to the act stripping him of the rights."

While the act permits much hunting by natives to continue, it also places some restrictions on the nature of the hunting. The law says none of the natives' hunting can be done "in a wasteful manner."

As interpreted by Mr. Tremblay and others here, that means it will no longer be possible for the natives to kill animals only to use selective portions, such as ivory tusks or hides. It was not the intent of the act to allow native hunters to expand on their traditional methods or practices, Mr. Tremblay said.

Even with those restrictions, some state management officials are skeptical of the effect of the act.

"Of course, we want the act to be effective, but we don't have any real role to play in it and so we'll just wait and watch for the results," Karl Schneider, research coordinator for the Alaska Department of Fish and Game, said.

A Coast Guard Cutter Is Rescued in Heavy Seas

Craft Hits a Reef or Rock on Fishery Patrol in Aleutians

JUNEAU, Alaska, Nov. 16 (AP)—The Coast Guard cutter Jarvis, one of the newest and largest of the high-endurance cutters, hit a reef or a rock yesterday near Dutch Harbor in the Aleutian Islands.

The vessel was reached today by a Japanese trawler and towed to safety after her engine room flooded and her power failed. The ship, with 170 men aboard, was virtually helpless in what were described as "mountainous seas."

The 378-foot Honolulu-based vessel was towed to an inlet on Sedanka Island after a nine-hour ordeal. A Coast Guard spokesman said that only the arrival of the Koyo Maru No. 3, a 336-foot fishing craft, prevented the Jarvis from being driven aground.

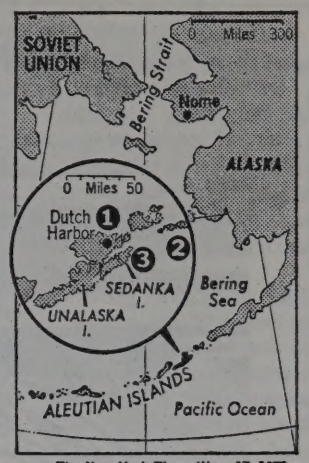
"The Jarvis has been damaged fore and aft the entire length of the ship," the spokesman said. "It's possible there is damage to the propellor shafts."

Three Coast Guard cutters assisted by aircraft were on their way to the island, located about 750 miles southwest of Anchorage in the north Pacific Ocean.

The spokesman declined to say that the Jarvis was safe, but commented, "She's in better shape than she was." None of the crew was reported injured.

Plans called for the cutter to be towed to an undetermined port for permanent repairs after the crew makes the vessel seaworthy.

Rescue came after the Jarvis sent an SOS late yesterday when what it called "mountainous seas" flooded the engine room, knocking out the engines and diesel power plants.



The New York Times/Nov. 17, 1972

Drifting 20 miles south of Akutan Island, the cutter rode out a severe storm last night and a lesser disturbance this morning.

The Jarvis first ran into trouble yesterday when, on routine fisheries patrol, she ran aground at Dutch Harbor near Akutan.

Emergency repairs were made and the vessel headed for Honolulu. She had completed 40 miles of the journey when the flooding began.

Three Coast Guard HC-130 aircraft dropped pumps and other supplies to the stricken cutter. It was planned to deliberately ground the ship until the Japanese trawler arrived.

A spokesman said there would be no word on what caused the near disaster until "we come out with an official report and can tell the whole story."

At one time, another Japanese ship, two Soviet vessels, and a Greek freighter were rushing to the area. Commissioned in August, the Jarvis is among the largest of Coast Guard vessels and is powered by two jet engines similar to those carried by B-52 Bombers.

Japanese Ship Tows Vessel to Inlet on Sedanka Island

Damaged Coast Guard Ship Patched Up With Concrete

JUNEAU, Alaska, Nov. 18 (UPI) — Coast Guard repair workers used temporary concrete patches today to cut down the flow of water into the engine room of the damaged Coast Guard cutter Jarvis.

A Coast Guard spokesman said water was still pouring through cracks in the ship's hull at a rate of 20 gallons a minute. However, he added that this was "well within the capabilities of the Jarvis's pumps."

Plans call for the cutter to be towed to Dutch Harbor, 24 miles away, after patches are welded on the outside of the hull. The cutter hit a reef or a rock Wednesday near Dutch Harbor.

Damaged Ship Quits Alaska

JUNEAU, Alaska, Nov. 30 (AP)—The damaged Coast Guard Jarvis was under way from Alaska's Aleutian Islands today to Honolulu to undergo permanent repairs after striking a reef 15 days ago.

Hearings End

HONOLULU Dec. 15 (AP) Coast Guard board of inquiry has ended four days of hearings into the grounding of the cutter Jarvis in the Aleutian Islands.

Adm. Joseph J. McClelland of Seattle, who chaired the three-man board, said his report will go to the Coast Guard commandant in Washington, D.C., for review. There was no indication as to when the report would be completed.

BLAST AT AMCHITKA SET OFF 22 QUAKES

WASHINGTON, Aug. 30 UPI) —The five-megaton nuclear test at Amchitka Island last November caused 22 small earthquakes and hundreds of blast aftershocks, a Government scientist reported today.

But it did not, as opponents of the test had feared, trigger the "natural earthquake-causing processess" in that geologically fragile area of Alaska's Aleutian Islands, he said.

An analysis of seismic data from the Amchitka test, called Cannikin, was made by Dr. E. Engdahl, a research geophysicis with the National Oceanic and Atmospheric Administration at Boulder, Colo.

The 22 quakes were "minor structural adjustments in the earths' crust" caused by the test explosion, detonated more than a mile deep on Nov. 6, 1971, Dr. Engdhal said.

Cannikin itself registered about 7.0 on the Richter Scale of quake magnitudes. The first and largest of these resulting quakes measured 3.5 on the scale. It occurred more than seven days after the test, the last occurred nearly three months later.

SULLIVAN IS WINNER OF PRIZE IN SCIENCE

The New York Times

BOSTON, Oct. 31—The trustees of Boston's Museum of Science announced today that Walter S. Sullivan, Science Editor of The New York Times, will be the 1972 recipient of the Bradford Washburn Award Award for increasing public understanding of science.

This will be the eighth Washburn Award to be presented since 1964 when it was established for an "outstanding contribution toward public understanding of science and appreciation of its fascination and the vital role it plays in all our lives."

The award carries with it a gold medal and an honorarium of $5,000. It will be presented at a luncheon on Nov. 19.

In announcing the 1972 award, the musuem trustees said:

"Walter Sullivan is a widely recognized and renowned interpreter of science. He has traveled to the uttermost limits of the earth to search out the truth and bring it back to his myriad readers. As journalist and author he expands the mind, captures the imagination, and puts the often elusive facts of science firmly within our grasp."

air medal

Sept. 29

Elgen Long of Woodside will become only the 11th American aviator in history to receive the Gold Air Medal to be awarded by the Federation Aeronautique Internationale in ceremonies in Paris, France, on Oct. 2. it was announced today.

Long won the award by being chosen "outstanding aviator in the world in 1971" by the organization.

Last Nov. 5, Long, a captain for Flying Tiger Line, Inc., flew solo around the world, pole-to-pole, setting eight world records.

Among the awards he has received is the Institute of Navigation's Superior Achievement award for practicing navigator of 1971 (previously won by Sir Francis Chichester and astronauts James Lovell and Richard Gordon).

The Smithsonian Institute has asked to consider his papers for inclusion in its museum and in the national archives.

He also has been flying his full 80-hour schedule monthly for Flying Tiger lines.

BOSTON SCIENCE Museum president, Norman Cahners, (left) presents science award to Walter Sullivan (center) of New York Times while museum director Bradford Washburn looks on. (Photo by William Ryerson) Boston Evening Globe

GREENLAND MOVES INTO MODERN ERA

Islanders Find Progress Has Its Debit Side

GODTHAAB, Greenland, Sept. 16 (Reuters)—Greenland, whose population 25 years ago was entirely dependent on hunting and fishing for a livelihood, still faces enormous problems in its transformation into a 20th-century economy.

If economics were the only consideration, there is no doubt that the cheapest and simplest solution would be to transfer the 41,000 Greenlanders and 7,000 Danes to metropolitan Denmark. Greenland, the world's largest island, has been an integral part of the Danish kingdom since 1953.

"One might think that the development of a country with a population of only 48,000 would be simple, but it has not been easy in fact," says Claus Bornemann, a senior official of the Ministry for Greenland, which is responsible for the island's government under the Danish Parliament.

He says the Government has encouraged a policy of migration to the main towns, where proper health, education and job opportunities can be provided.

Increasing numbers of Greenlanders now live in modern multistory apartment houses. They work in modern fish-processing factories and in their leisure hours they watch cable television.

The New York Times/Sept. 24, 1972

But a major problem has been how to change their mental attitude to cope with the demands of a modern industrial society.

Per Justesen, production manager at the Godthaab fish processing factory, explains: "As a hunter, the Greenlander caught a seal and lived off it until he needed to catch another. The Greenlanders obviously find it difficult to adjust to regular working hours and to work every day."

Many people, both Greenlanders and Danes, attribute this partly to a lack of participation by the local inhabitants in the development process. Nearly all the senior administrators and businessmen and 80 per cent of the teachers are Danes.

Considering Greenland's geographical location in the far north of the Atlantic, it is a wonder that there are any indigenous inhabitants Five-sixths of the island's 700,000 square miles is covered by Arctic ice and snow.

Until after World War II Greenland remained a closed colony, deliberately isolated from modern development. Outsiders had to get special permission from the Danish Government to visit the island.

But in 1948, a crash program was launched to give the Greenlanders equality with the Danes in all respects. Greenlanders now send two members to the Danish Parliament and elect their own provincial council, a body with primarily advisory powers. However, its recommendations are almost always followed by the Ministry for Greenland

Denmark's biggest single success has been in health improvement. Tuberculosis, once the scourge of Greenland, has almost been eradicated. Life expectancy, only about 35 years in 1951, is now around 60 years.

But the pace of development has also had undesirable social side effects in the form of drunkenness, a high rate of venereal disease, a rising birth rate and increasing crime.

The future of the island is uncertain, but economically it could be rescued by the discovery of oil and natural gas. A mineral expert of the Ministry for Greenland, Otto Jensen, regards the prospects of such a discovery as promising.

Meanwhile, the younger politicians are pressing for more jobs and power of decision for the Greenlanders themselves.

"We do not want to break our links with Denmark," says Lars Emil Johansen, a 25-year-old teacher and member of the Provincial Assembly. "But we want cooperation on more equal terms."

OTTAWA ASSERTS ITS ARCTIC RIGHTS

Sovereignty Over Area Is Implied in Pollution Law

By JAY WALZ
The New York Times

OTTAWA, July 29—A pollution control measure that in effect asserts Canada's sovereignty over her Arctic waters becomes law on Wednesday.

The measure requires ships plying the northern seas and waterways to abide by severe antipollution regulations and to carry insurance guaranteeing the costs of cleaning up any spills of pollutants, particularly oil.

When it pushed the legislation through Parliament a year ago, the Government emphasized that it had a duty to protect the environment of its northern territories, whose vast underground resources are just beginning to be tapped.

The trial voyage through the Northwest Passage of the United States supertanker Manhattan in 1970 added point to the legislation. Prime Minister Pierre Elliott Trudeau voiced a common fear that the movement of bulk carriers through the ice-filled straits would inevitably bring oil spills to the region.

The United States Government has always held that the Northwest Passage above Canada's mainland is international water. Canada, however, argues that the waters through the archipelago, no less than the islands, are Canadian.

Proceeding with legislation aimed strictly at pollution prevention, Mr. Trudeau avoided the complex sovereignty issue. Yet the effect of the law is to keep out traffic that Canadian authorities object to. Regulations under the law apply in all waters above the 60th parallel within 100 miles of any Canadian shoreline. There is no way to negotiate the Northwest Passage without entering waters controlled by the new Arctic Waters Pollution Prevention Act.

The law allows Canadian officials to inspect any ship going through the passage to make sure it is properly equipped with pollution control devices.

At the moment there is no important enforcement problem, for the only vessels known to be in the passage are the few Canadian supply ships on summer rounds provisioning Eskimo settlements and Government installations.

The foreign traffic principally concerned is that entering Hudson Bay bound for the port of Churchill in northern Manitoba. For several years the Government, by improving harbor and dock facilities, has tried to promote shipping out of this inland port. Although it is a shortcut for export of grain from the Canadian prairies, there has not been notable success because of the short ice-clear season, which begins about July 31 and ends in early September.

This summer about 60 vessels are expected to make one visit each to Churchill. Most are Canadian supply vessels but others will be grain ships flying the flags of the Soviet Union, Britain and other north European countries.

Soon after the law was enacted, Government officials became aware that the liability provisions of the act were so severe that few ships would risk the voyage to Churchill. This caused dismay in that port.

This week officials in the departments of Northern Development and of Transport said that, after many discussions with the insurance companies, ways have been found to provide ships with insurance covering all liabilities under the law.

Canadians Find Pilot of Plane Lost in the Arctic for a Month

By The Canadian Press

YELLOWKNIFE, Northwest Territories, Dec. 8 — Canadian rescuers today found the pilot of a twin-engine airplane that crashed in the Canadian Arctic on Nov. 8. He was reported to be in "excellent" condition considering his ordeal.

The pilot, Martin Hartwell, 47 years old, was the only survivor of the four persons who were aboard the plane when it went down during a medical mercy flight.

The search for the plane was one of the largest in Canadian aviation history and cost more than $1-million. It had been suspended two weeks ago but was resumed after protests.

Mr. Hartwell was brought to Yellowknife by military helicopter and was immediately taken to a hospital here. Doctors said that he had suffered fractures of both ankles and of his left knee but that his condition was "excellent" considering his ordeal.

Reporters were not allowed near Mr. Hartman's room. But a spokesman for Gateway Aviation, Mr. Hartwell's employer, said that the pilot had told him how the three passengers on the flight had died.

The passengers were Judith Hill, a 27-year old nurse, who came to Canada from England three years ago and had just completed her first year in the Arctic; Nemee Nulliayok, a pregnant Eskimo woman who was in premature labor, and a 14-year-old Eskimo boy, David Kootook, who was believed to have been suffering appendicitis. All three were from Spence Bay, Northwest Territories, an isolated village on the Boothia Penninsula, east of Cambridge Bay.

The Beechcraft plane owned by Gateway Aviation, Ltd., was on a 500-mile flight from Cambridge Bay to Yellowknife Hospital when it disappeared.

According to the Gateway spokesman, Mr. Hartwell said that Miss Hill, an employe of the Northern Health Service, died in the crash and that Mrs. Nulliayok, who had been suffering labor complications, died a few days later.

Young David Kootook survived for 23 days, the pilot was quoted as having said, but then suddenly appeared to lose strength and died.

A Canadian military spokesman said the plane was "heavily damaged" but could provide no details.

Miss Hill, who operated a nursing station at Spence Bay, had hitched an air ride to Cambridge Bay for herself and her two patients on Nov. 8 on another Gateway plane. They were going to Yellowknife because there are no doctors or hospital facilities in Spence Bay.

Mr. Hartwell had been doing charter work, but he volunteered to fly the group to Yellowknife when he learned that the youth and the pregnant women needed immediate medical help.

A native of West Germany, Mr. Hartwell had two years of experience flying in the North.

Earlier this week the crew of an armed forces aircraft heard a transmission from a crash-position indicator while on a regularly scheduled flight. A search of the area followed, but nothing was found late Thursday or yesterday, a Canadian armed forces spokesman said.

He said that at dawn today three rescue planes again flew to the area, and the plane was sighted late this morning. Mr. Hartwell was standing beside it with a burning flare.

A paratroop rescue team was dropped at the site, and it and the survivor were picked up by an armed forces helicopter.

The plane was located 30 miles South of Great Bear Lake, about 230 miles west of Contwoyto Lake. The site was 180 miles west of the plane's charted course and was outside the original search area.

The armed forces search was resumed Dec. 1 after being suspended for five days after aerial coverage of about 200,000 square miles in 1,000 hours of flying time.

Defense Minister James Richardson ordered the resumption of the search after concern about rescue efforts was voiced by people flying in the north.

On leaving Cambridge Bay the plane carried rations to last five people at least six days. There were also five sleeping bags, warm clothing and other survival equipment on board.

Find Crash Plane After 15 Years

Aug. 16

FROBISHER BAY, N. W. T. (AP)—A single-engined aircraft reported missing in the Canadian Arctic 15 years ago with two men aboard has been found on Baffin Island.

The Mounted Police said yesterday that the only clue to the whereabouts of the passengers, whose names were not released, was a note found inside the aircraft. The note said the pilot and his passenger, a doctor, were trying to walk to a radar station 75 miles away or to the coast after spending a week with the aircraft.

Police said the Taylorcraft, which was only slightly damaged, was spotted by a helicopter pilot. A ground party is looking for the bodies of the two men.

Research Ship Sets Out

WOODS HOLE, Mass., July 18 (AP) — The Woods Hole Oceanographic Institution's research ship, Knorr, began today a 15,000-mile voyage to study the deep circulation of the seas from the Arctic Circle to the coast of Antarctica. The ship's first port of call is to be Reykjavik, Iceland, and from there she will go to the Norwegian Sea to begin tests of the current that flows from there to Antarctica.

Canada's Bush Pilots May Have to Fly by the Rules

By JAY WALZ
The New York Times

OTTAWA, Dec. 23—The increasing incidents of downed and lost aircraft in the frozen and now entirely dark Canadian north has called into question the role of the time-honored bush pilot.

No fewer than 75 searches conducted by the Canadian military this year have brought new pressures on the Federal Government to modernize the frontier-style civil aviation that "opened" the north and still prevails over an expanse of six million square miles of bleak land and ice-clogged sea.

Federal authorities are investigating the crash in November of a light aircraft on a mercy mission from an Arctic Sea island in the Northwest Territories.. Three died —a pregnant Eskimo woman being evacuated to a hospital in Yellowknife, a nurse and an Eskimo boy, age 14. The pilot, Martin Hartwell, was rescued after enduring 32 days of subzero cold in the wilderness.

The German-born Mr. Hartwell, who learned to fly in World War II Luftwaffe, came to Canada in 1967, made his way to the north and became one of that special breed of aviators—the Canadian bush pilot.

A Canadian Folk Hero

The finding of the lost plane and its lone survivor ended a vast search involving miiltary and civilian planes, scores of volunteer squatters and other bush pilots.

"The bush pilot has become a folk hero to us," said one Ottawa official this week. "He has been to the Canadian north what the Pony Express rider was to the American West. But his day is about done."

The bush pilot, a stubbornly independent fellow, has always considered the cruel climate a challenge and he has not been one to let regulations ground him, if he could help it.

"If you can get the plane's nose in the air, the tail will follow," a bush pilot of long experience once told a reporter. It was a bush pilot's point of pride to take his plane out "when those air force jockeys" were ordered back to the hangers.

Usually such boasting was backed by real courage and great skill. Tales of bush pilot derring-do abound in the north, and northerners are confident the bush pilot opened up their land. But times and sentiment are changing.

Unnecessary Deaths Noted

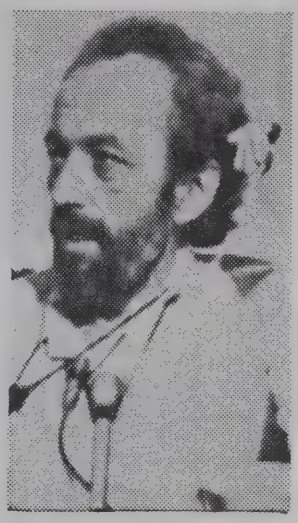
"The present rough-and-ready system saves many, but kills others unnecessarily," commented Colin Alexander, publisher of the News of the North, a newspaper in Yellowknife, after Mr. Hartwell's rescue.

Last year the Canadian Armed Forces Search and Rescue Service was alerted 3,463 times. There were 33 major searches, of which 31 were for civilian aircraft. Twenty-eight were found and 322 lives were saved. The cost to the Canadian taxpayers was $11-million.

The adventuresome bush pilot is by no means the only cause of the mishaps. The Arctic region, though still sparsely settled, is taking in a growing number of prospectors, oil exploration and drilling crews, Government agents, schoolteachers and airplane crews.

Often planes are the only means of flying in food and construction materials, or flying out sick personnel. Officials report planes are often overloaded to beat bad weather, and flights from isolated points are attempted in the face of storms. The white-out —the Arctic equivalent of a desert sandstorm—is a frequent hazard.

In recent years, the sportsman-sightseer with a pilot inexperienced in northern flying, often the plane's owner, has caused Canada's aviation overseers increasing alarm. On 32 occasions last year, searches were held for "foreign" (usually American) planes in trouble while on recreational flights over Canada. One hears of an American family deciding to fly the Canada-Alaska Highway route using a gasoline-station highway map as its only navigational aide.



Martin Hartwell, whose plane crashed in November, was rescued after enduring 32 days of subzero cold.

The consensus is that tougher regulations are in order. Aircraft are not required (as they are now in the United States) to install emergency locator transmitters, which send radio beeps from downed aircraft. Pilots in the north are not required to file flight plans, or notify a responsible person of their air movements. Licensing regulations are loosely enforced.

In Ottawa, where a special interdepartmental committee has been looking into the problem, there has been no decision on who should be principally responsible for search and rescue. The Department of Transport, which supervises all civilian flying, could have jurisdiction and the armed forces, which have widespread operations in the Arctic, is also involved but a program providing principal responsibility has yet to be worked out.

The cause of Mr. Hartwell's crash is now being investigated. On a flight from Cambridge Bay on Victoria Island to Yellowknife, he had 550 miles to cover. Thinking he might have wandered off course as far as 100 miles either way, search planes, hampered by much bad weather and darkness, covered an area of 100,000 square miles. On Dec. 9, the plane was located 200 miles off course by the crew of a military plane on a routine flight. The plane's instruments picked up the whisper of a radio signal from the wrecked plane.

After completing this 74th search in the Northwest Territories in 1972, Brig. Gen. Ramsay Withers of Canadian Forces Northern Region Headquarters said he would recommend a permanent search and rescue base be established in Yellowknife. (The nearest base has been Edmonton, Alberta, about 1,200 miles to the south.) The number of downed planes has been increasing steadily in recent years, he said, adding, "We can see no great evidence that the trend's going to reverse—and there is a trend."

BILINGUAL PROGRAM SAID TO AID ESKIMOS

NUNAPITCHUK, Alaska (UPI)—In several tiny Alaska villages, school children in the first two grades are learning their lessons in Eskimo while English is taught as a second language.

At Nunapitchuk in southwestern Alaska, 22-year-old Miss Sophie Parks keeps the children busy with songs, stories and lessons in the language they speak at home.

Miss Mary Elizabeth Parala, an English teacher from Michigan, is the counterpart in the bilingual education program and believes the children learn more quickly by starting their lessons in Eskimo.

"They are doing much better as far as concept development is concerned," she said. "They are learning more than they possibly could in English alone."

The Eskimo-English program was introduced in seven village schools last year and it has won the praise of the Alaska Federation of Natives, Bureau of Indian Affairs and the state's school system for rural Alaska.

Federation officials would like to see the program extended to hundreds of other first and second grade children who are being taught only in the English language.

Federation leaders believe the English-only classes retard the educational process and contribute to the breakdown of the strong family life of Alaska's remote villages.

Donald R. Wright, AFN president, said more bilingual classes are needed along with the programs the state school system has initiated to help close the gap between cultures of the white middle class teacher and the native student.

Alaska Eats Most Ice Cream

ANCHORAGE, Nov. 20 (AP) —Residents of Alaska, the nation's northernmost and coldest state, are the nation's largest per capita consumers of ice cream, the state Agriculture Department reports. Figures show the average state resident consumes six gallons a year, about twice the national average.

Wooden ships, iron men, and the great Alaskan overland rescue mission.

Few rescue missions in history have attracted more public attention than the famous overland expedition of 1897-98. Few heroes in history have accomplished greater feats of daring than Coast Guard Lt. David H. Jarvis, who led the humane mission.

Winter cold struck the north coast of Alaska unusually early in 1897, trapping an entire fleet of whaling ships in heavy ice near Point Barrow, Alaska. The eight ships affected by the freeze had carried only enough provisions to last until their planned return to San Francisco in December. By early November the whalers and their 265 crewmen were stuck solidly in ice which no ship would possibly be able to penetrate until July or August of the following year. Without provisions they were doomed.

President William McKinley ordered that a relief expedition be organized. The immortal revenue cutter Bear, commanded by Capt. Francis Tuttle, was chosen for the job. Because of the extremely hazardous nature of the task, Capt. Tuttle refused to take anything other than a volunteer force. Every officer and crew member on board offered to go.

The plan was for Bear to land a rescue party as far north as possible. Because of the extreme conditions encountered, however, the gallant ship was unable to approach Alaska's northern limits and was forced to put the rescue party ashore almost 2,000 miles from the position of the desperate whalers. Lt. David Jarvis was chosen to lead the expedition, assisted by 2d Lt. E. P. Bertholf (later a commandant of the U. S. Coast Guard), and the ship's surgeon, Dr. S. J. Call.

The party landed at the tiny Eskimo village of Tununak Dec. 15, 1897. There they met Alexis Kalenin, a trader who agreed to guide them to St. Michael, 250 miles to the north. The Bear turned back and wintered at Unalaska Island.

The trip to St. Michael required 13 arduous days. In order to pick up a fresh dog team, it was decided to split up the party, and Lt. Bertholf proceeded on independently. In St. Michael, Jarvis and Call were able to get two new dog teams from the commander of the local Army post. The elements, however, proved to be much less cooperative. Each step of the way had to be fought through sub-zero temperatures.

Upon reaching Point Rodney, they succeeded in obtaining a herd of 138 reindeer from Charlie Artisarlook, an Eskimo. Artisarlook also agreed to go along with the herd to care for the animals. The deer were turned over to Lt. Jarvis on the basis of nothing more than a handshake and a promise of reimbursement. They were to serve as food for the ice-bound whalers.

Wearing the primitive but remarkably efficient clothing of the Eskimos, Jarvis and Call continued their journey. The weather was so intensely cold that even the reindeer and Eskimos were miserable.

After extreme hardships they reached Cape Prince of Wales, where a U.S. government reindeer station was located. The Rev. William Lopp, keeper of the station, also agreed to turn his deer over to the rescue party and to accompany the group. They were still 700 miles from their destination.

Never before in history had such a group attempted to cross the rugged mountains and frozen tundra in the middle of winter. There were no paths to follow, only driving winds and snow. At times the temperature dropped as low as -70 degrees.

In order to reach Point Barrow, it was necessary to cross either the frozen waters of Kotzebue Sound or take a longer route which would have added almost another two weeks to the journey. No time could be spared. They would have to try the sound, although ledges of jagged ice jutted up to heights of 40 feet, making the passage so perilous as to be nearly impossible. A few deer succumbed to the hardships of the frantic pace, but the rescuers fought onward toward Point Barrow. One deer was killed when the herd came under attack from starving wolves.

Jarvis and Dr. Call rendezvoused with Lt. Bertholf on the other side of Kotzebue. Bertholf, too, had faced many hardships and had not been nearly so fortunate as the others in his choice of travelling companions. On more than one occasion he had been abandoned by Eskimos and dogs. It was decided that he would stop over at Point Hope to set up an intermediate way station for the whalers in the event food shortages forced Jarvis to send any of the men down from Point Barrow.

Proceeding ahead of the herd, Jarvis and Call at last reached their destination on March 29, 1898. The reindeer arrived a day later. The stranded, starving whalemen were incredulous. Most had already reconciled themselves to gradual death from cold and hunger.

There was still much to be done. Many of the men were already near death from scurvy and other diseases. Others had reverted to violent and almost animalistic behavior. Some of the ships had been com-

Heroes of the Overland Expedition. (L. to r.) 2nd Lieut. E.P. Bertholf (later a Coast Guard Commandant), Surgeon S.J. Call, and Lieut. David H. Jarvis.

pletely destroyed by the pressure of ice. The situation was further aggravated by the fact that some ships were separated from the others by as much as 100 miles.

Jarvis soon demonstrated that his organizational skill equalled his courage. Systematic medical treatment was begun. Housing was built. Food was intelligently distributed and rationed. Daily cleanliness inspections were instituted. Recreational and work programs were begun to raise the whalemen's spirits.

It was July 28 before the Bear was able to reach Point Barrow, and even then the ice pack had hardly receded. Jarvis saw to it that the whalers whose ships were still seaworthy were well provisioned. Then, with 97 men whose ships had been destroyed, the rescued and their rescuers boarded Bear for the long voyage home.

In volunteering for the expedition, Jarvis made a difficult personal decision. His wife was expecting their first child within the next few months. His natural inclination was to stay with her until the child was born. But the plight of the whalers was desperate and there could be no delay. Soon he would be in a vast and frozen wilderness, defying the bitter winter of northern Alaska. There was always the chance that he might not return. But his strong sense of duty won out.

According to Jarvis's daughter, Miss Anna T. Jarvis of New York City, her father was a quiet, almost taciturn man who shied away from personal publicity. The enormous publicity which followed the completion of the expedition and made him one of the most celebrated men of his time embarrassed him. He was completely professional in his attitude towards his work in the rescue of the whalers. He was that rare kind of man who placed the honor of his country and service above personal advantage.

In 1905, following his advancement to captain and a three-year appointment as a collector of customs for Alaska, Jarvis resigned from the Revenue Cutter Service (now the Coast Guard) to accept an important executive position with the Northwest Fisheries Co. When this company was taken over by a vast syndicate operated by the Morgan and Guggenheim families of New York, Jarvis was appointed treasurer of the entire organization. His manifest ability and broad knowledge of almost every aspect of Alaskan industry made him particularly well suited for such a position.

In 1911, to complete surprise of family and associates, Jarvis tragically and inexplicably ended his life. He was 48, with a wife and three children. A brilliant career lay before him, making his death all the more tragic. But his heroism had earned him an enduring place in the annals of human achievement.

Adapted from "This Is the Coast Guard," book by Lt. Cmdr. James F. Hunt, USCG, and H. R. Kaplan.

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2D TRIAL FREES MAN IN ICE FLOE SLAYING

ALEXANDRIA, Va., Nov. 2 (AP)—Mario Jaime Escamilla of Santa Barbara, Calif was acquitted today in his second trial on a charge of involuntary manslaughter in the 1970 death of a fellow weather researcher on an Artic ice floe.

Mr. Escamilla, 35 years old, was convicted in 1971 in the shooting death of Bennie B. Lightsy, 42, the leader of a 19-member Government weather research team. He was sentenced to three years in prison.

But the United States Circuit Court of Appeals for the Fourth District ordered a new trial last summer on grounds that the judge had improperly instructed the jury about the difference between voluntary and involuntary manslaughter and had refused to allow more than one character witness to testify on Mr. Escamilla's behalf.

The jury in the second trial handed its acquittal verdict after receiving the case this morning.

Mr. Escamilla conceded he waved a loaded rifle at Mr. Lightsy.

The Government contended that by loading the rifle and leaving the safety off, Mr. Escamilla was wilfully using deadly force in a situatiin where it was not necessary for his protection.

Pipeline Spurs Fish Study

MOSCOW, Idaho, Oct. 23 (UPI) — The proposed Trans-Alaska pipeline has prompted the Bureau of Sports Fisheries and Wildlife to spend $56,000 to find how well Arctic grayling fish can swim through culverts. Dr. Fred Watts, associate professor of hydraulics, and Dr. Craig MacPhee, fishery management professor, will conduct the research at the University of Idaho.

Ship To Drill Deep Cores In Antarctic

By CLIFF SMITH
Science Writer
The San Diego Union

Dec. 12

Man's first effort to deeply core the antarctic sea floor was announced yesterday by the Deep Sea Drilling Project headquarters in La Jolla.

The project ship Glomar Challenger will leave on the mission from Fremantle, Australia, on Dec. 22, to spend two months on the wild waters immediately adjacent to the polar continent.

The goal is to core the bottom hundreds of feet deep in each of 18 different places along a course spanning nearly a third of the continent's perimeter.

Most of the drilling will be directly into the submerged shelves of the continent. To do this, the ship will have to venture more than 2,000 miles farther south than it has ever drilled before.

The payoff could be revelation of some of the greatest mysteries remaining in the earth sciences.

Better estimates of the future state of the antarctic ice cap and better understanding of world climate are among the benefits that may come out of the expedition.

A written briefing on the expedition issued by DSDP explained that scientists are generally agreed that "the antarctic continent is the control point of many of the oceanographic and climatological phenomena that are felt throughout the entire globe."

Drs. Dennis Hayes and Lawrence Frakes, co-chief scientists for the cruise, also noted a diversity of opinion in speculation on what will happen to the antarctic in years to come.

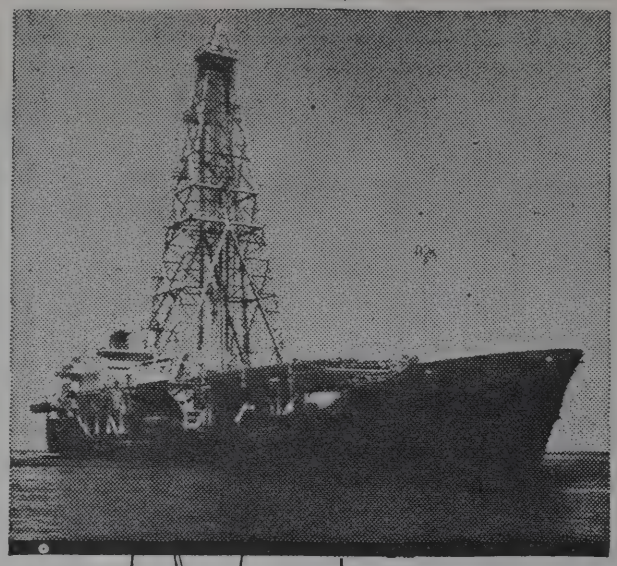
If antarctica were to be transplanted to the North Pole, it would reach from Alaska to Scotland in its greatest dimension.

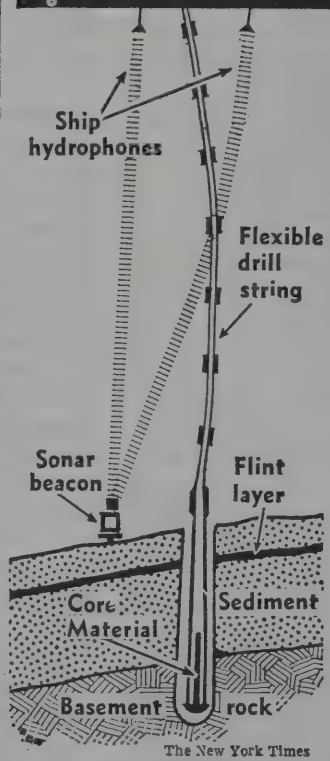
Encompassing over 5 million square miles, most of the continent is covered with ice up to about two miles thick. About 90 per cent of all the ice on earth is in the antarctic.

"If it were melted, antarctic ice would produce a rise in sea level throughout the world of about 150 feet," cruise leaders said.

Antarctica's geological nature and history are largely a great blank, they said.

However, Hayes and Frakes noted that what can be inferred from the uncovered sediments of antarctica's climate in the past is disturbing.





Glomar Challenger, above, with aid of beacon and hydrophones to keep position, can drill in three miles of water. Cores are hauled up through pipe.

They explained that sediments of onshore antarctica, where it is not covered with ice, contain fossils of amphibians, insects and plants all revealing a warm climate until, at most, about 20 million years ago. The fossils indicate that this warm period in antarctica lasted for about 180 million years.

"The time of onset of continental glaciation still is a controversial issue," the scienfists said. "However, there is very strong evidence to indicate the presence of major glacial effects through the continent as long as four to seven million years ago, and perhaps much longer for more restricted areas."

The sediment cores obtained in the coming expedition should help clarify the continent's climatic history and its role in influencing global weather.

Other important questions that may be resolved, project scientists said, are:

1 — History of the movements of vast plates of earth crust beneath the sea around antarctica and of islands and sea floor ridges in the area.

— Chronology of the breakup of the theoretical, prehistoric supercontinent Gondwanaland.

Hayes heads the department of submarine topography a Lamont-Doherty Geological Observatory in Palisades, N.Y. Frakes is associate professor of geology at Florida State University at Tallahassee.

The voyages of the Glomar Challenger, known as the Deep Sea Drilling Project, are financed by the National Science Foundation and are administered by the Scripps Institution of Oceanography. Interviews with participants and a study of the reports, published and unpublished, have brought to light, among others, the following discoveries and conclusions:

¶Although man is descended from creatures that lived in the sea, all of the oceans inhabited by his ancestors have vanished. None of the major ocean basins of today existed when the mammals began to evolve from certain reptilian species about 180 million years ago. The geography of the oceans has, so to speak, been completely recycled.

¶In the floor of the Bering Sea, gravel deposited by melting icebergs was found in sediment laid down as early as seven million years ago. A similar time had been determined by other means for the onset of the South Polar glaciation. From two drill sites in the Labrador Sea it was estimated that glaciation in that region began three million years ago. it has been proposed from these observations that the onset of ice accumulation in both polar regions followed the change in ocean currents as Panama rose from the sea.

¶Another phenomenon that may be related to such changes is the occurrence of "tile floors" of chert—a hard type of rock including flint—that lie interbedded deep within the ocean sediments. Over large areas in both the Atlantic and Pacific they were laid down during the early Eocene, 50 million years ago, when dog-sized horses and primitive camels were roaming North America.

The Glomar Challenger is breaking new ground, scientifically, because she is the first ship capable of drilling thousands of feet into the floors of oceanic basins. On her last leg completed May 2 she bored 4,264 feet into the bottom of the Arabian Sea beneath 11,610 feet of water. Thus the total length of drill pipe exceeded three miles.

The only oceanographic expedition that has produced a comparable flood of new findings was that of the British steam corvette H.M.S. Challenger, from which the drill ship took its name. H.M.S. Challenger roamed the world for three and a half years in the eighteen-seventies, collecting a wealth of specimens and data.

The other part of the Glomar Challenger's name is derived from that of its owners, Global Marine Inc. of Los Angeles.

The project leaders at Scripps are Drs. William A. Nierenberg, and Melvin N. A. Peterson.

Map Unexplored Ice Mass

San Francisco Chronicle
By David Perlman
Science Correspondent

McMurdo Station, Antarctica Nov. 25

Four American scientists and a Soviet colleague left this ice-bound American outpost on the edge of the frozen sea recently for a journey few men will ever experience again.

They flew 1700 miles across the Antarctic continent to map one of the last totally unexplored areas left on the surface of the earth.

At the end of their flight they unloaded the Navy cargo plane that carried them; they set up camp on a desolate snowfield pocked with bare-ribbed rocky mountain tops, and prepared to travel by ski and motorized sledge across 15,000 square miles of unknown terrain.

They will be gone three months amid the coastal mountains of the Lassiter Range, and when they return they hope that their geology studies will forge another link of proof in the emerging theory of the proto-continent called Gondwanaland.

PETER ROWLEY AND EUGENE KAMEMEV
Head of the expedition and his Soviet associate

Gondwanaland is the name scientists give to a vast and still uncertain land mass that is believed to have dominated much of the globe hundreds of millions of years ago. Its bulk contained what is now most of Africa, India, Australia, South America and Antarctica, and it straddled the equator with empty seas around it.

Some 200 million years ago, the theory holds, Gondwanaland began to split apart amid earthquakes, furious volcanic eruptions and tidal waves that continued for 50 million years.

Even after that the contnents continued to drift. Antarctica headed toward the South Pole, and tropical polar climates began to cook as the new southern continent replaced warm oceans and brought on a polar ice age that has lasted ever since.

South America and Africa drifted to their present positions, the theory says, and their undersea continental shelves still fit like a jigsaw puzzle today. India thrust itself northward against the Asian land mass, and that collision created the Himlayas.

Proving Gondwanaland has been an exciting task for geophysicists and geologists for a generation. And there are many signs of proof: Magnetism frozen into strata of ancient rocks matches layer by layer across the fossil beds of Africa and Australia.

The "Beacon sediments" — 7500 feet of hardened muds, shales, coal and sandstones — lie atop the older Pre-Cambrian basement rock in identical fashion on all the Goindwanaland continents.

Now a five-man Antarctic exploring party is seeking new evidence for Gondwanaland in the magnetism, the micro - crystalline structure and the geological formations of the unknown Lassiter Coast range.

Heading the party is Dr. Peter Rowley of the U.S. Geologic Survey in Denver; his Soviet associate, a veteran of five Antarctic summer seasons and a long winter with the Americans at McMurdo, is Dr. Eugene Kamenev of Leningrad's Institute of Artic Geology.

A second mission, headed by John R House of the USGS, was set to follow Rowley and Kamenev into the Lassiter Coast, and to begin mapping from a field site 200 miles away a day later.

But Rowley's Navy Hercules plane tore apart a ski landing gear when it hit a hidden rock outcrop in the snow, and the aircraft had to limp home to McMurdo Station, out of commission. It is now being repaired in New Zealand.

So critical is the logistic schedule that must be maintained during the brief Antarctic summer, and so short are the planes and heavy strictions, that House's group may not reach the mountains this year.

Rowley and Kamenev, however, are in the field now, living in tents and a single canvas-walled hut. Their partnership is not unusual in Antarctica, where scientists of the nations now maintain research stations and work together on many projects.

To Rowley, geologizing and mapping the unknown Lassiter Coast is a great, if perilous, scientific adventure. Winds blow 80 to 90 miles an hour; whiteouts, where snow and cloud completely obliterate all landmarks and horizons, dominate the daylight; glacier crevasses 20 feet wide endanger men and vehicles.

The mountains form part of the greatest range in the world, a range whose peaks run northward from Antarctica through the Andes, the Rockies and the Sierra, and over the top of the world to Japan and New Zealand.

Understanding the origin of the mountain formations is of more than theoretical interest. For as Kamenev said:

"The crystalline structure of many ancient Antarctic rocks closely supports the Gondwanaland theory. It is an interesting theory, but it will be most interesting if it leads to practical results — where to look for minerals

Antarctic Land Dry as a Desert

By David Perlman
Science Correspondent

Lake Bonney, Antarctica Dec. 1

"We may smell a little," said Paige Geering apologetically, "because we haven't had a bath in a month."

"But there's plenty of water for coffee — all I have to do is run down to the lake with an ax and chop out some fresh ice."

Miss Geering, a 21-year-old biology major from Richmond, Va., and her classmate, Gail Tomimatsu, were working in an improvised laboratory by a frozen lake in Antarctica's Taylor Valley.

The valley is utterly bare, a wind-carved area of drifting sand and ice-free rock that holds no resemblance at all to the rest of the snow-covered polar continent.

Except for the hanging glaciers that cling to the high ridges above the frozen surface of Lake Bonney, the dry valley terrain could be the desert of America's Southwest. Its stones are red, brown and black; eroded pinnacles jut from mountain spurs; deep canyons slash through millions of years of upthrust sediments.

Victoria Land, a coastal region of Antarctica not far from McMurdo Station, abounds in dry valleys, and no one knows why they should lie so free of snow. The bitter winds sweeping down from the Polar Plateau may dump their snow against mountain barriers before they reach the valleys. The cold air may be so dry that cliff-like glacier edges simply evaporate as they advance.

Only in the few weeks of Antarctic midsummer, around January, do the lake surfaces thaw briefly and the glaciers send small streams of runoff water threading across the valley floors.

The National Science Foundation maintains a tiny field station here at Lake Bonney, where five scientists are exploring the 100-foot-deep lake and its ten feet of thick ice cover.

Miss Geering and Miss Tomimatsu are two of the team — "we sleep under the lab tables here in the hut," explains Miss Geering carefully, "and the guys sleep out there in the tent."

Their professor, Dr. Roger Hatcher of Virginia Polytechnic Institure, leads the group, and their closest neighbors are a New Zealand party at Lake Vanda, nearly 20 miles away. Food supplies, and occasional visitors, come in by Navy helicopter.

Lake Bonney, according to Dr. Hatcher, houses an extremely simple ecological system, with only three kinds of primitive life: algae, bacteria and fungi – each dependent on the other for nutrition.

Because Antarctic air and land are so clear and unpolluted, Lake Bonney is clear too. It holds no excess phosphates or nitrates. Its oxygen content is unusually rich.

"What we're doing here," said Hatcher, "is describing in detail the real-life energy flow of the lake's simple ecosystem, so we can develop mathematical models to explain the effects of ecological changes in more complex bodies of water closer to home.

"Using a computer we'll be able to calculate precisely, for example, the effect of polluting a lake like this with phosphates or nitrates, or of cutting its sunlight in half, or dosing it too heavily with carbon dioxide. And that should help us predict more accurately the consequences of pollution at home."

PAIGE GEERING
Ice for coffee water

GAIL TOMIMATSU
Bed under a table

The Dry Valley region is also enormously interesting to geologists who have been studying the sedimentary rocks here for clues to past climates and geological history ever since the International Geophysical Year of 1957-58.

The three men and two women gather their samples of ice and water, seed their culture plates to grow the lake organisms, and send them off periodically by helicopter to the National Science Foundation's biological laboratory at McMurdo Station. Then they gather around the stove in their apple-green hut to eat, to read, to talk shop.

"It doesn't get lonely at all," says Miss Geering. "And when we do want to hear a new voice, we can always call McMurdo on the radio. There's plenty of guys there waiting to chat with us."

Large team

There will be more New Zealanders in the Antarctic this summer than ever before. Out of an approximate total of 120 at least 70 will be there to carry out scientific research; and this year only one woman, Miss Janet Crump, has been selected.

Miss Crump, of Victoria University, will study Lake Vanda in the Wright (dry) Valley.

The reason for the larger number this summer is that projects which for economic reasons had to be shelved last year have been brought into this year's programme.

Of those scientists selected two are Canadians who flew to New Zealand specially to be considered for Antarctic positions.

Apart from the official New Zealand Antarctic research programme team there will be a number of short-term visitors. These will include some of the delegates who will be attending the Antarctic Treaty nations conference in Wellington in November, and the chairman of the State Services Commission (Mr I. G. Lythgoe).

There will be representatives of the Ministry of Works who will be inspecting base buildings and equipment, and Post Office engineers as well as various Government scientific organisations representatives.

More than 400 applicants were interviewed throughout the country by the superintendent of the Antarctic division of the D.S.I.R. (Mr R. B. Thomson) and the leader of the 1972 New Zealand Antarctic Research team (Major P. G. Frazer).

The complete number of New Zealanders going to the continent will meet for the first and only time at the Tekapo training area at the end of this month. There they will undergo orientation and two weeks of training in a variety of skills necessary for living and working in the Antarctic.

Bagging Seals for Science

By David Perlman
Science Correspondent

McMurdo Station, Antarctica Dec. 4.

An eight-foot-long Weddell seal gave a loud territorial grunt as Don Siniff and his graduate student deftly slipped a canvas bag over the bull's head.

Then, in calming darkness, the animal lay still while Siniff fastened a waterproof radio transmitter around its left rear flipper.

Released from the bag, the seal barked once, made for the nearest hole in the thick ice of the Ross Sea, and slid into the water.

A large harem of females basking with their soft-pelted pups on the ice nearby watched the proceedings silently. The crowd of humans did not seem to alarm them; they yawned, snorted softly and hardly stirred.

Dr. Donald Siniff, a behavioral biologist from the University of Minnesota, is studying the population dynamics of seals here for an urgent purpose: commercial seal hunting is about to become a reality in the ice-packed waters of Antarctica, and strict conservation rules must be based on firm scientific knowledge.

The bull with the mobile transmitter offers one route to that knowledge. As the animal swims beneath the ice and interacts with other seals — copulating, fighting, ranging far for fish — its location signals reveal unknown aspects of its life style.

Last year Siniff used underwater television cameras to watch seal behavior at close range. This year hydrophones strategically lowered through ice holes are picking up sonic signals from the battery-powered transmitters while the seals are underwater, and radio frequency receivers track the pulses while the animals lumber awkwardly across the ice surface.

Navy photo by Ralph Payne

Scientists at McMurdo Station caught a Wedell seal to implant a transmitter

Siniff is trying to determine how Wedell seal colonies appear to regulate their populations through behavior alone. They face no environmental threats: They are adapted to cold; no predators threaten them; and the Antarctic waters are fabulously rich in fish and the shrimp-like plankton animals called krill, so there's plenty of food.

Yet Siniff and his colleagues, taking census across the McMurdo Sound area year after year, have noted that the seal colonies in this area bear a total of 500 pups annually, and the figure never varies.

The researchers don't yet know why. They don't know why some bulls are unsuccessful in the yearly competition for mates, or why so many females produce no pups at all.

There may be as many non-productive females each year as there are mothers, Siniff believes. Successful males may wind up with harems of six or seven females; unsuccessful bachelors get none.

Seals and whales, their lives based on water, are Antarctica's only two varieties of mammal, for there are no land mammals on the continent at all.

The fate of the great whales — hunted in all the oceans to virtual extinction — is a dreary tale of ecological waste.

The Southern Fur Seal, which once numbered in millions around the subantarctic islands, was clubbed and shot to oblivion within 50 years after sealers learned of the booty from Captain Cook's voyage in 1773. Only today are fur seals beginning to make a successful return.

In London earlier this year 12 nations signed a Sealing Convention that set conservation rules and catch limits for all seals in Antarctica.

Under the Convention the annual limit on krill-feeding Crabeater seals — whose population is estimated at 50 million — is set at 175,000 adults. The Leopard seal quota is 12,000 a year, and the allowable Wedell seal kill is 5000. All catches must be reported to the international scientific committee of seal specialists who set the limits. The rare Ross seals, Elephant seals and Southern fur seals are totally protected and cannot be hunted at all.

Siniff, whose research here is one of 21 Antarctic biology projects financed this year by the National Science Foundation, is a member of the seal committee and helped draft the Convention.

The Soviets have already reported that they have made a preliminary harvest of 1000 Crabeater seals "for research and industrial purposes," according to Siniff. They are believed to be readying factory ships for larger seal harvests.

And the Russians are also beginning to harvest the fantastically abundant, protein rich Antarctic krill, which could yield an estimated 50 million tons a year — as much as the entire world's annual catch of ocean fish.

While many conservationists opposed the Antarctic Sealing Convention on the grounds that the animals should be left undisturbed until far more is known about their numbers and reproduction, Siniff disagrees.

A Land Without Conflict

By David Perlman
Science Correspondent

McMurdo Station, Antarctica Dec. 5

Britain's Antarctic researchers felt they owed the United States some favors this year in return for the thousands of miles that American Navy planes have ferried British scientists to outposts across glaciers, mountain ranges and frozen seas.

So last month six Royal Air Force crews and two RAF Hercules planes flew here from London to launch a series of 20 shuttle missions, carrying American men and supplies between Christchurch, New Zealand, and McMurdo Station.

At the same time a French research vessel is ferrying scientists from America and other nations to island research stations along the Antarctic Peninsula, while Americans air-drop supplies to a French tractor train on the Polar Plateau.

And the Russians and Americans are exchanging scientists for joint research projects at opposite ends of the polar continent.

Ten nations maintain scientific research stations in Antarctica, and seven of them have actually staked territorial claims. The continent, 5.5 million square miles, is bigger than the United States and Mexico combined, and many of the territorial claims overlap. There may be mineral ice. The ocean resources are immense.

Antarctica would seem ripe for conflict.

Yet there is no conflict, and the scientific cooperation so freely offered and accepted here is far more than symbolic; it is real.

That cooperation began with the International Geophysical Year of 1957-58, when space exploration opened and Antarctic science burgeoned.

Then, in 1959, delegates from 12 nations signed the Antarctic Treaty, a unique document that set aside all territorial claims for 30 years and dedicated the entire continent to peaceful research.

The treaty bans all weapons of war. Outposts and bases of all nations on the continent are open to free inspection by observers from signatory nations. All scientific information must be freely exchanged. Nuclear explosions and disposal of radioactive wastes are forbidden.

Five more nations have signed the treaty since then, and the agreement will come up for renewal in 1990.

Many political experts feel that despite the tremendously significant scientific research accomplished in Antarctica during the last 25 years, the treaty is the most important accomplishment of all.

It has proved a valuable precedent for later agreements banning nuclear weapons in outer space and on the ocean bottoms, and making Latin America a non-nuclear zone.

Delegates from the treaty nations met in New Zealand recently to discuss thorny questions of environmental protection and resource development in Antarctica.

Then they flew to McMurdo Station to see the National Science Foundation's Antarctic Research Program in action, and on to the South Pole for history's first international political meeting at that unlikely spot.

At McMurdo they saw impressive logistics effort at the end of a 10,000 mile supply line — warehouses bulging with 120,000 items from dehydrated meat bars and canned tortillas to Norwegian sledges, Japanese cargo toboggans and reels of old family-rated American movies.

They talked about sewage disposal in the sea and smoke-free methods of burning garbage, about how to air-ship frozen urine barrels out of remote field stations and how to pack plastics, rubber, old oil drums and other non-degradable wastes for shipment home.

They discussed the successful creation of specially protected Antarctic areas — the Cape. Crozier penguin rookery, for example, where even scientists are barred, and the historic original huts of Antarctic pioneers Robert Falcon Scott and Ernest Shackleton, now international monuments.

They argued over a proposal by France and Chile to declare an indefinite moratorium on all commercial exploitation of Antarctic resources, and over an American counter-proposal, backed by the Soviets, to place a two-year limit on the moratorium pending a more detailed resource assessment.

Finally, when they couldn't agree on this question, they voted politely to study the probem with "care and diligence" until it can be debated again at their 1974 meeting in Oslo.

James E. Heg of the National Science Foundation an American delegate to the sessions, pointed to a major new cooperative concept proposed by the British and now developing broad support: A truly international airline to serve all Antarctic scientific bases.

Under the concept, he said, America would provide ski - equipped Hercules aircraft for support operations on the ice. The Soviets could contribute heavy - lift inter - continental planes. Other nations would supply small planes and helicopters ships and tracked surface vehicles.

"The idea is going over like gangbusters," Heg said. "Every nation would contribute according to its ability and receive according to its needs.

"It looks as though we'll have a real international airline system down here in another five years. It's another example of what can be done under this Antarctic treaty, where everybody really wants to get along."

Raw Penguin Meat Kept Them Alive

Scott Base, Antarctica

Raw penguin meat may not be a gourmet's delight. But for an American and three New Zealanders there was not much else to eat for five days while they jumped from one crumbling ice floe to another.

An iceberg also rammed them once. Finally a U.S. Navy helicopter rescued James Kenneth Lowry, 30, Richmond, Va., and the three other marine biologists Sunday. They were treated for fatigue, frostbite and snow blindness at McMurdo Station.

The engine on their boat had stopped Wednesday, and they drifted into pack ice.

Lowry said they had some food in the boat, but it soon ran out and they had to capture a penguin and eat it. The boat was abandoned when they had to jump from floe to floe as the ice broke up while lashed by waves and a southerly wind.

The men joked and sang to keep warm and their spirits up. To keep from freezing, Lowry said, they took turns patrolling around their floe.

They saw a plane Friday night and fired flares to attract attention, but they were not noticed. A British air force transport on its way to New Zealand saw them Sunday and called the rescue helicopter.

Dec. 4 *Associated Press*

Volcanic Ash May Have Induced Ice Age

By WALTER BENJAMIN
Daily Camera Staff

Nov. 18

Fine volcanic ash shot into the earth's stratosphere may have contributed to the ice age, a geologist specializing in Antarctic glaciology said Friday.

Anthony J. Gow, geologist with the U.S. Army Cold Regions Research and Engineering Laboratory (USACRREL), Hanover, N.H., proposed this theory Friday to participants of the 10th annual briefing, "New Horizons in Science," held this week at the Harvest House Hotel in Boulder.

The meet was sponsored by the Council for the Advancement of Science Writing, Inc., and ended Friday.

Gow participated in USACRREL's recovery of core samples from the entire 7,100-foot depth of ice at Byrd Station, Antarctica — a record of climatic and atmospheric conditions on the earth over the last 100,000 years.

Volcanic ash found in the ice samples has a positive correlation to the coldest periods of the ice age, Gow explained. And this cooling trend didn't end until the deposits of ash ceased, leading scientists to assume a cause-and-effect relationship.

When a volcano explodes, ash is thrown into the stratosphere and the particles hang there for several years, screening out the sun's beams and lowering the temperature, Gow explained.

Scientists discovered both coarse and fine volcanic ash in the Antarctic ice cores. The coarse particles had to come from volcanoes in Antarctica, Gow said.

But the finer particles were likely borne by air currents from volcanoes "anywhere in the world," he said. Researchers have found ash in one section of ice which likely came from the Krakatoa eruption in the Indian Ocean in 1883.

Gow noted temperatures of the Antarctic ice sheet have remained fairly constant and activity there occurred simultaneously to glacial activity in the northern hemisphere.

For example, 50,000 to 60,000 years ago, the Antarctic ice mass experienced a five degree (Centigrade) decrease in temperature, at the same time glaciers began creeping over Wisconsin.

About 16,000 years ago, Antarctica experienced its coldest period (-40 degrees C.) and the ice cores contain larger concentrations of dust than anywhere else in the ice sheet.

Nearly 12,000 years ago, Antarctica's weather reached its warmest temperature yet and at the same time, glaciers began receding from North America and Europe.

Gow said scientists theorize if the earth ever experiences sustained volcanic activity, volcanic dust could build up in the stratosphere on a global scale and trigger a significant cooling of the world's climate.

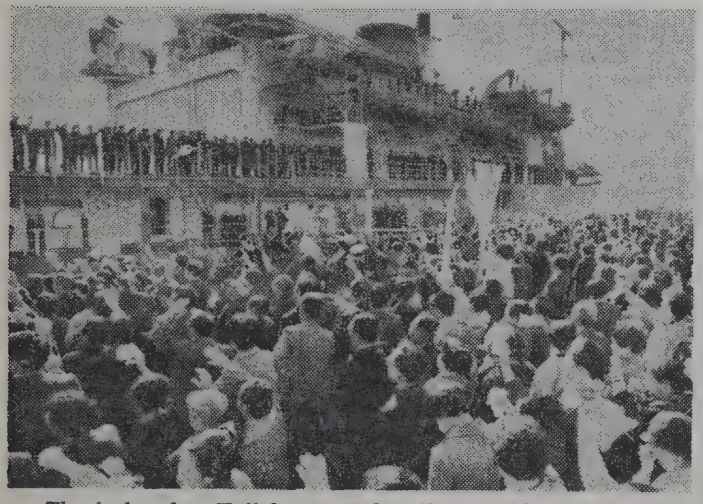
Indirectly, the world climate would be affected by the cooler temperature causing the Antarctic ice sheets to expand, cooling the oceans which, in turn, would affect the different climates of land masses.

As for the future, Gow said analyses of ice samples from the last 100 years and 2,000 years ago indicate the world climate will be in the "throes of a cold cycle until 1984, when the temperature might warm about one-half degree Centigrade."

Some people have predicted the ice caps will melt in the future, raising the oceans' levels and inundating great portions of the continents under water.

Gow shrugged this off as hogwash. "To melt the ice sheets on that order of magnitude, the temperature would have to increase six degrees Centigrade, which is extremely unlikely."

Antarctic Survey Ship Fuji Leaves



The icebreaker Fuji leaves Tokyo Port amid send-off from a crowd of well-wishers

TOKYO, Nov. 25

The 7,760-ton icebreaker Fuji, carrying the 14th Japanese Antarctic wintering team left Tokyo Port for Showa Base on Ongul Island Saturday morning.

The Fuji, skippered by Fuyuki Maeda, is expected to reach the South Pole's outer fringe ice in late December via Fremantle in Australia.

It will then try to berth itself at Showa Base by late February for the relay of the wintering team. A new 30-man wintering team will replace the previous team now at the base.

Ice had denied the Fuji's access to the base twice — in 1971 and 1972 — when men and heavy materials had to be transported by helicopters.

Heavy materials, including a rocket launching pad and large snowmobiles, can be hauled by air this time, if necessary.

The new wintering team is expected to delve into the mystery of aurora by injecting seven rockets into it. The team will also explore the Antarctica with snowmobiles.

Between November 1973 and January 1974, nine men will make a trip on four snowmobiles over a distance of 1,500 kilometers.

They will conduct a check on some 700 markers erected previously and measure the drift of ice and snowfall.

Bodies of Three Women Found on Alaska Peak

MOUNT McKINLEY NATIONAL PARK, Alaska, July 23 (UPI)—Rangers at Mount McKinley National Park said today that the bodies of three Japanese women mountain climbers have been found at the 15,000-foot level of the 20,320-foot mountain. The climbers had been missing since June 29.

The bodies were found yesterday by Ray Genet, a rescue climber. First reports indicated the women had reached the summit and were returning to their base camp when they were caught in a snowstorm. They were identified as Nobue Yajimi, 31 years old; Misuko Toyama, 30, and Sachiko Watanable, 25.

Soviet Floe Over North Pole

MOSCOW, July 14 (AP) — An ice floe bearing the manned research station Severny Polyus 19 passed over the North Pole today in a first for Soviet arctic exploration, the Soviet press agency Tass reported.

U.S. science official will see how the money is spent

Dec. 9

A man responsible for an annual budget of $600m arrived in Christchcurch yesterday on his way to the Antarctic, where he will get a first-hand idea of how $25m of its is spent.

He is Dr H. G. Stever, director of the American National Science Foundation who, accompanied by Dr G. Murray, a member of the foundation's governing body, will spend four days in the Antarctic.

"This is a critical time for us, as any moment now we will learn how the National Science Foundation's budget for next year will look, and it is important that we present a good case to Congress regarding the financial allocation we seek," Dr Stever said.

"In Washington, I get force-fed a lot about the Antarctic in the course of my daily work. This visit should give me a closer sensitivity to the problems, so that I will be able to understand them better as they come up before me in Washington," he said.

Of the $600m, Dr Stever said that the largest portion, $250m, was for basic scientific research projects, and their support, for small research scientists at universities. The next largest amount was allocated to the N.S.F.'s national and international programmes, which included the Arctic and the Antarctic.

Dr Stever said he was unable to say whether the National Science Foundation would try to procure an extra two ski-equipped Hercules aircraft in the next financial year. This year, it was authorised to buy three of the five it originally sought for the support operation.

In spite of the National Science Foundation taking over the financial control of the Antarctic research programme, Dr Stever said he personally believed there were no plans to transfer the support role from the United States Navy to commercial operators.

"In think we will be under continuous pressure to determine the Navy's future support role. I feel we get far better value from the Navy than from a commercial support operation, although I have no doubt the matter will

Dr Stever

be studied each year," he said.

While it was unfortunate that the Navy was reduced to only three ski-equipped Hercules this season, Dr Stever paid tribute to the help of the Royal New Zealand Air Force, and Royal Air Force units in recent weeks.

Such assistance was but a further example of the excellent spirit of co-operation that existed between the nations working in the Antarctic—a co-operation which he hoped would become increasingly closer.

On future research in the Antarctic, Dr Stever said he saw, as now, more multinational scientific projects taking place. Although the Antarctic Treaty had another 20 years to go, the United States had no long-range plans for research there much beyond this.

"We work on a five-year planning cycle, and beyond this specific long-range plans are pretty nebulous," he said.

On pollution and the environment, Dr Stever said the National Science Foundation was concerned about the problem in relation to the Antarctic.

Ecology pressures in the United States were very great, and it was now normal practice for Government agencies, when engaged on developmental proposals and projects, to make statements about what the environmental impact of these would be. "We are very sensitive about this on the Antarctic continent," Dr Stever said.

During his brief visit there, Dr Stever will, weather permitting, visit the Russian Vostok base. There was today a much greater scientific exchange between Americans and Russians, and so there was nothing specific about his visit there.

An Ice Age Is Creeping Up on Us

Norwich, England Sept. 13

A new Ice Age is creeping over the Northern Hemisphere, and the rest of this century will grow colder and colder, a British expert on climate claims.

Professor Hubert Lamb, director of climate research at the University of East Anglia, had a few comforting thoughts in a recent interview:

"The full impact of the new Ice Age will not be upon us for another 10,000 years and even then it will not be as severe as the last glacial period.

"We are past the best of the interglacial period which happened between 7000 and 3000 years ago," he continued.

"Ever since then we have been on a downhill float regarding temperature. There may be a few upward fluctatioss from time to time but these are more than offset by the general downward trend."

Lamb said temperatures had been slowly dipping for the past 20 years.

"We are on a definite downhill course for the next two centuries," he declared. "The last 20 years of this century will be progressively colder. After that the climate may warm up again but only for a short period of decades."

Lamb said climate changes come in cycles determined by astronomical and physical factors. He said one main cause is the amount of radiation received from the sun.

"We know that the behavior of the sun changes at intervals and these changes have their effect," he eaid. "The distance between th earth and the sun also varies through the ages as the earth's orbit increases or decreases its elliptical path. The tilting of the earth as it rotates round its own axis also makes the polar ice cap grow, and this affects the air masses round it."

The last great ice age took place about 60,000 years ago and was the sixth over a period of about a million years. The great ice sheets covered most of the British Isles and in America covered what are now New York City, Cincinnati, St. Louis and Kansas City.

The ice was at least 5000 feet thick.

"I don't think it will be quite as serious this time," Lamb said. "But there will be a lot of glaciers on high ground which do not exist at present."

SCIENTISTS TO DRILL IN ANTARCTIC ROCK

WASHINGTON, Oct. 25 (UPI) —An international scientific team will drill a hole nearly a mile deep into the bedrock of Antarctica next year in the first deep penetration of the continent.

The National Science Foundation said today that the project was intended to get information on how Antarctica, once a part of the Southern Hemisphere's ancient temperate zone continent of Gondwanaland, drifted over the last 200 million years to its present position.

The hole will be the first of at least 10 to be drilled in the next three years. The first bore will be made in January and February on Ross Island where Mount Erebus, an active volcano, rises 12,000 feet above sea level.

The drilling team will include 30 scientists from Japan, New Zealand and the United States.

In a parallel project, the oceanographic ship Glomar Challenger will drill holes in the Antarctic sea floor. Rock cores brought up by the two projects are expected to tell much about the continent's climatic and geologic history.

Planned field research projects

The 1972-1973 United States Antarctic Research Program will include research at or near five U. S. antarctic stations, at three remote field locations, at Deception Island, and aboard icebreakers off the Oates Coast and in the Ross and Weddell Seas. The research ship *Eltanin* will work in the southern Indian Ocean, and the small research ship *Hero* will operate in the Antarctic Peninsula area in conjunction with Palmer Station.

Major efforts for this season will be (1) drilling of the Dry Valley Drilling Project's first hole—on Ross Island near McMurdo Station, (2) continuation of a topographic and geological survey of the Lassiter Coast, (3) continued support for the International Antarctic Glaciological Project, (4) establishment of a year-round facility at Siple Station, and (5) deep-sea drilling by *Glomar Challenger* off the Ross Ice Shelf. Year-round programs at Pole, McMurdo, and Siple Stations will continue to concentrate on atmospheric sciences, while work at Palmer Station will emphasize marine biology.

Carl R. Eklund Biological Center dedicated at McMurdo Station

On February 27, 1972, personnel of the U.S. Antarctic Research Program, the U.S. Naval Support Force, Antarctica, and New Zealand's Scott Base gathered at McMurdo Station to dedicate the biological laboratory in memory of Carl Robert Eklund, biologist, who died in 1962. The selection of the biological laboratory as a memorial to Carl Eklund is an acknowledgment of his dedication to polar research and his contribution to antarctic biology. Built in 1959, the laboratory was the first scientific facility for support of research in Antarctica, and indeed for many years was the only professional laboratory in the Southern Hemisphere below 55°S. The latest professional apparatus and scientific supplies allow biologists to carry out sophisticated experiments, extending the scope of possible research and *in situ* studies.

Following an introduction by McMurdo Station's officer in charge, Commander Richard L. Mautino, U.S. Navy, and a benediction by Lt. Edgar A. Snyder, Jr., U.S. Naval Reserve, Chaplain, Dr. George A. Llano, the Office of Polar Programs' program manager for polar biology and medicine, spoke. He said, "The existence of this fine center for biological work is in no small measure due to the foresightedness of Carl, who, as a member of the Committee on Polar Research, insisted on the construction of adequate laboratories as a primary means for advancing polar biology. He was concerned with both arctic and antarctic polar research, but Antarctica was undoubtedly his first love. His dedication is revealed not only through his personal involvement in polar expeditions but also in his professional career with the Polar Branch of the U.S. Army and in his bringing to existence the Antarctican Society. His contribution to antarctic biology includes the first biotelemetric research in Antarctica, an early and important study on seal populations, and initiation of a cooperative international avian birdbanding program. Carl was a keen sportsman with a deep appreciation for the principles of conservation. He represented the United States at two Antarctic Treaty consultative meetings. At the Buenos Aires meeting, he presented the U.S. recommendations for conservation, now a vital part of the Agreed Measures for the Conservation of Antarctic Flora and Fauna. Above all, he was a good leader, commanding respect and cooperation, and those who were with him at Wilkes Station in 1957–1958 recall his enthusiasm and his wonderful sense of humor. The excellent cooperation that existed at Wilkes Station between the Navymen and the scientists is shown in the research paper, 'Measuring the temperatures of incubating penguin eggs,' written by Carl Eklund and Frederick E. Charlton, a Navy electronics technician chief who assisted Carl in his work, and published in the March 1959 *American Scientist.*"

After the dedication ceremony, which was held in the nearby National Science Foundation chalet, the party moved outdoors to the biological laboratory, where Dr. Llano unveiled a plaque commemorating Dr. Eklund. ANTARCTIC JOURNAL

Antarctic trek

Dec. 12

The 10 Frenchmen who are now on the last stage of their 1000-mile, two-year traverse of Wilkes Land to the Russian Vostok Station had completed 193 miles of the journey on Saturday.

Led by Marcel Renard, the party set out on its traverse from Carrefour, a small advance base 25 miles inland from the main Dumont D'Urville Station, on November 11 after being delayed from departing by bad weather for 10 days.

Dogged by sastrugi up to 5ft high and other difficult surface conditions the traverse party had reached the 124-mile mark by November 19.

On November 21 a United States Navy ski-equipped Hercules dropped the first field supply of fuel. A second supply drop is due next week.

The party pushed on from the 124-mile mark on November 27 after being held there by bad weather and temperatures of down to minus 43deg C.

The traverse was forced to stop again, after proceeding only six miles, to repair a broken track on one of the two vehicles.

The Frenchmen reported that the American Hercules which crashed while making a jet-assisted take-off from the ice-cap on December 4 last year was half buried by snow but was still visible.

This summer the scientists intend to study an under-ice dome found last year between Vostok and the point from where they resumed the last stage of the traverse.

The traverse is part of the International Antarctic Glaciological Project, planned by France, the United States, the Soviet Union and Australia.

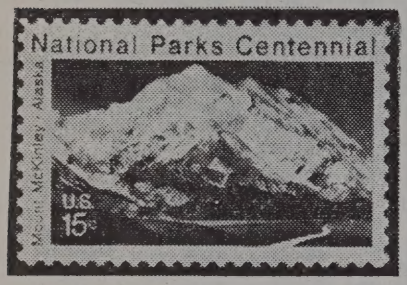
Unfavourable ice conditions off the Adelie Land Coast are expected to affect the progress of the French supply ship, Thala Dan, which was to have left Hobart on Monday. Satellites have revealed a compact, fast ice-belt about 62 miles wide.

Victoria Land

Stamps of New Zealand were overprinted "Victoria Land" in 1911-13 for use by the Scott Antarctic Expedition.

Antarctica Circumnavigation

Australia has announced that the 7-cent and 35c stamps featured were placed on sale in the nation's philatelic centers on September 13. Issued for the Australian Antarctic Territory, the set marks the 200th anniversary of Captain James Cook's circumnavigation of Antarctica. The designs show Cook and a sextant on the left and the "HMS Resolution" and a map of Antarctica on the right. The designer was John Mason; printing was photogravure in sheets of 100 subjects by the Note Printing Branch, Reserve Bank of Australia, Melbourne.



The Mt. McKinley stamp, designed by James Barkley, of Yonkers, N.Y., will also be multicolored, depicting the snow-mantled mountain as the focal point of the 3,030 square-mile wilderness area. Mt. McKinley—Denali, "the high one, home of the sun" to Alaska's Indians—was named for President McKinley.

Frequently shrouded in clouds, but brilliant in sunshine, twin-peaked Mt. McKinley is North America's highest mountain. Its southern peak is 20,230 feet, its northern peak is 19,470 feet. Charles Sheldon, the naturalist, led the campaign to make the mountain a national park in 1917. Later, the timbered land surrounding it was added to the park area.

Adds To Series

Greenland will add the third stamp in its series illustrating traffic to include the conveyance of mail in the nation throughout the ages on September 21. The new item is a 70-ore showing a "Umiak" (women's boat.) The designer was Jens Rosing with engraving by C. Slania.

ICE CAP PHILATELY

The American Society of Polar Philatelists concerns itself with Arctic or Antarctic postal operations, publishing a bimonthly journal, "Ice Cap News." Data on the society is available from Mrs. Audrey McComas, 5836 Compass Drive, Los Angeles, Calif. 90045.

Norwegian Polar Vessels

The Norwegian Post Office will release on September 20 60-ore, 80o, and 12o denominations featuring the nation's polar exploration vessels of "Maud," "Fram," and "Gjoa," respectively. Printing, after designs by Henry Welde, will be photogravure in dark olive, red, and blue, respectively, by Emil Moesue, Oslo in sheets of 50 subjects.

Wildlife Conservation

The United States jumbo-size Wildlife Conservation quartet announced previously pictures (left to right, top and bottom) the fur seal, cardinal, brown pelican and bighorn sheep. Details of the issue are reported in Linn's of August 28.

Ascension Honors Explorer Shackleton

The 50th anniversary of the death of Explorer Ernest Shackleton was noted on August 2 by Ascension with the release of four commemoratives designed by J. E. Cooter and lithographed by House of Questa, reports StanGib Ltd. The 2½-pence value shows a map of Shackleton's journeys; 4p, his portrait and ship, "The Quest"; 7½p, inside view of his cabin, and the ship pushing through an ice pack; and 11p, statue of the explorer in London. Jameson Boyd Adams, one of three men who accompanied Shackleton on his attempt to reach the South Pole, called the explorer "the greatest leader that came on God's earth, bar none."

Courtesy of Linn's Stamp News.

Louise Arner Boyd Dies at 84; Led Expeditions to the Arctic

SAN FRANCISCO, Sept. 16 (AP) —Louise Arner Boyd, a former debutante who achieved world renown as an Arctic explorer, died Thursday night after an extended illness. She would have been 85 today.

A funeral service is scheduled Tuesday in San Rafael, with burial at Mount Tamalpais Cemetery.

Explored New Areas

Miss Boyd made exploration history in June, 1955, when she became the first woman to make a successful flight over an daround the North Pole. She made the flight with a small group whose task was to photograph the area.

Miss Boyd's explorations from 1931 to 1938 included regions in and around Franz Josef Land, Spitsbergen, Greenland, Jan Mayen Island and eastern Arctic Canada.

According to historical records, Louise Boyd's ship, the S.S. Veslekari, was the first to sail to the inner ends of Ice Fjord, Greenland. Most of the expeditions she organized between 1926 and 1938 were carried out under the auspices of the American Geographical Society.

In June, 1941, Miss Boyd was chosen to head an investigation of magnetic radio phenomena in Greenland and other waters. She worked then in cooperation with the National Bureau of Standards.

In subsequent years Miss Boyd organized, financed and led several expeditions to the Arctic, including her flight to the North Pole in 1955.

She was honored by the United States Government and a number of foreign governments for her geographic studies and explorations.

In 1960, Miss Boyd became the first woman councillor of the American Geographic Society, an organization of professional geographers and educators.

Born in San Rafael, Calif., on Sept. 16, 1887, she became an accomplished horsewoman and crack shot at a comparatively early age.

Miss Boyd belied the popular image of the Arctic explorer. She was feminine, graceful and gentle. When not on expedition, one of her hobbies was gardening.

Some years ago she was quoted as saying: "I like the pleasant things most women enjoy, even if I do wear breeches and boots on an expedition, even sleep in them at times.

Louise A. Boyd in 1938

"I have no use for masculine women. At sea I don't bother with my hands, except to keep them from being frozen, but I powder my nose before going on deck, no matter how rough the sea is. There is no reason why a woman can't rough it and still remain feminine."

In Franz Josef Land, Miss Boyd shot a few polar bears—her favorite animal. She not only shot them, but watched them for hours on end, photographing them in every conceivable position.

Miss Boyd's contribution to the search for Roald Amundsen was so valuable that Norway presented her with the Order of St. Olaf, First Class. She was the only foreign woman to receive that honor.

The French Government made her a Chevalier of the Legion of Honor, and the French Navy, through the Minister of Marine, gave her a miniature of the medal set with diamonds, with the inscription, "Hommage, Reconnaisance de la Marine Francaise a Miss Boyd."

She was co-author of three American Geographical society publicaitons, "The Fjord Region of East Greenland," "Polish Countrysides" and "The Coast of Northeast Greenland."

For her valuable work in exploration, Miss Boyd also received a host of honors.

Among them were the Cross of the Legion of Honor from the French government and the Cullum Award from the American Geographical society.

She also received the Andree Plaque of the Swedish Anthropological and Geological society and was awarded the Medal of King Christian X of Denmark. She held honorary doctor of laws degrees from both the University of California and Mills College; was a Fellow of the Royal Geographical and Royal Horticultural societies of England; a member of the Association of American Geographers, and an honorary member of the California Academy of Sciences. The University of Alaska awarded her an honorary doctorate of science in 1969.

In 1934, the U.S. sent her to represent this country at the International Geographic Congress in Warsaw.

And in 1941, she returned to Greenland on a special scientific expedition for United States Army Intelligence.

The American Polar Society, honoring her with a scroll in 1959, credited her with contributing more to the knowledge of Greenland, Spitzbergen, Franz Josef Land and the Greenland Sea "than has the work of any other explorer."

Dr. Erich M. Schlaikjer, 66, Brooklyn College Geologist

Dr. Erich M. Schlaikjer, a former professor of geology at Brooklyn College, died Nov. 5 at his home in Littleton, Colo. He was 66 years old.

Dr. Schlaikjer was particularly noted for a 3,000-mile tour by boat and airplane of Alaska in the early 1930's. He found fossils that established beyond doubt a link between the North American continent and Asia.

He also led expeditions seeking dinosaur remains for the American Museum of Natural History. The geologist-paleontologist was a member of the Explorers Club and the New York Academy of Science

He leaves his wife, the former Josephine Ayres; two children by an earlier marriage, Michael A., and Mrs. Maren De Pietro of Manhasset, L. I., and eight grandchildren.

Lyle B. Womack, a Member Of Byrd Expedition to Pole

PRINEVILLE, Ore., Sept. 14 (UPI)—A memorial service is planned Saturday for Lyle B. Womack, a member of Adm. Richard E. Byrd's first expedition to the South Pole, who died Sunday as a result of a kick from a pet burro.

Mr. Womack, 70 years old, had worked as a lion tamer and professional boxer before settling here to become a real estate developer.

Mr. Womack, who came from a prosperous distilling family in the Canal Zone, was in the news even before he sailed with the Byrd expedition in the fall of 1928.

A year earlier, his then wife, Ruth Elder, attempted to fly the Atlantic Ocean with another pilot, George W. Haldeman. Their plane, The American Girl, went down near the Azores but both were picked up by a Dutch tanker. An estrangement followed, and Mr. Womack received a divorce decree, ground of desertion, while the expedition was in Little America.

JOHN L. SUTTON

The New York Times

WEST NEW YORK, N. J., Nov. 26—John L. Sutton, a retired supervisor with the Curtiss - Wright Corporation in Wood-Ridge, died today in Christ Hospital, Jersey City. He was 72 years old and lived at 6515 Boulevard East.

Mr. Sutton was a member of the late Rear Adm. Richard E. Byrd's expeditions to the Arctic in 1925-26 and to the Antarctic in 1928-30.

Surviving are his widow, the former Mary McGill, and two sisters, Helen and Margaret Sutton.

BENNIE BENSON

KODIAK, Alaska, July 2 (AP) —Bennie Benson, designer of the Alaska flag, died today, apparently of a heart attack. He was 58 years old.

Mr. Benson won a gold watch and $1,000 by submitting the prize-winning design for the flag in a contest sponsored by the American Legion in 1927. The flag shows the Big Dipper and North Star in gold on a field of blue.

Soviet Research Ship

MOSCOW, Dec. 8 (AP) — The Soviet research vessel Ob, flagship of Russia's Antarctic fleet has left for the South Pole carrying food, planes and scientific equipment, the news agency Tass reported.

U.S. Navy Photos by Ralph Payne

The field station at Lake Bonney in Taylor Valley, one of the Antarctic's mysterious dry valleys

McMurdo Station, headquarters for U.S. activities in the Antarctic